

# Machine and Tool **BLUE BOOK**

A DIGEST OF THE METAL WORKING INDUSTRY

**JULY, 1948**

**THIS MONTH**

Investment Casting at Allis Chalmers

Central Lubrication

Manufacture of Direct Drive Motors at  
Knapp-Monarch

Company Picnics

Handwheel Design

What's New in Metalworking

Available Literature

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**COMPLETE INDEX ON PAGE 5**

**A HITCHCOCK PUBLICATION**

# "MARVEL" HAS the edge

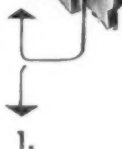


MARVEL High-Speed-Edge Blades assure Faster, more Accurate cutting with proven Economy and complete Safety. Only the MARVEL is a composite blade with a genuine 18% Tungsten high speed steel cutting edge electrically welded to an exceptionally tough, strong steel body.

The High-Speed-Edge does the cutting while the alloy back with hardened eyes, carries the load. Blade tensions up to 300% higher than those possible with ordinary blades are recommended. This greater tension is confined to the cutting or leading edge by the location of pin holes (exclusive MARVEL design feature) and cannot be overcome by work resistance. Heavier feeds and greater speeds are practical without "run out."

With greater accuracy, higher production and lower cost per cut, come the extra dividend of Safety, for MARVEL High-Speed-Edge Hack Saw Blades are Positively Unbreakable — **they will not shatter.**

Ask your local MARVEL distributor (see classified phone book) to help you modernize your metal sawing with MARVEL High-Speed-Edge Blades. They cost no more than ordinary high speed steel blades.



1.

Genuine 18% Tungsten High-Speed-Steel cutting edge.

2.

Tough unbreakable alloy steel body with hardened eyes.

1&2.

Integrally welded to make a fast-cutting, long lasting composite blade that is **positively unbreakable.**

## ARMSTRONG-BLUM MFG. CO.

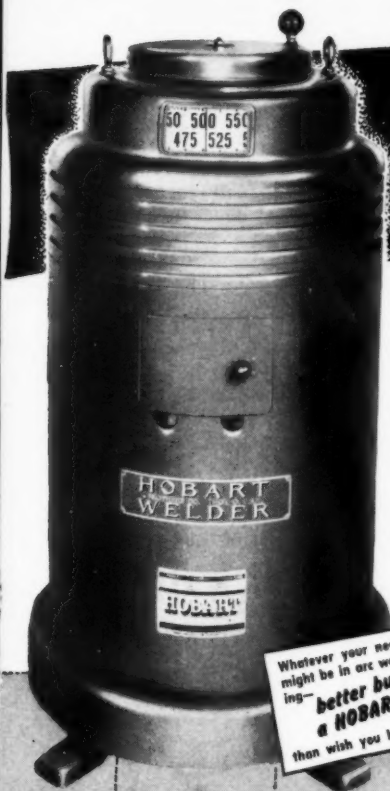
"The Hack Saw People"

5700 Bloomingdale Ave.

Chicago 39, Illinois







*Cut power consumption while you increase welding speeds with the*  
**New Hobart A.C.**  
*Industrial Type Welders*

**MORE for your money...  
 extra liberal ampere capacities**

This new and improved AC welding transformer permits use of larger electrodes and higher welding currents which increase welding speeds as much as 30%. Since there is virtually no magnetic "arc blow" with the Hobart Industrial AC, high quality welds are assured even when welding in deep grooves, corners, and similar difficult locations.

Current adjustments are quickly made by turning the hand wheel on top of the unit. An exceptionally large current indicating scale of translucent plastic, illuminated from within by a 110 volt lamp, makes it easy to read the current setting from a distance in either light or dark locations. No other AC welder on the market compares with Hobart's advantages for faster, lower cost welding. Write today for complete details and specifications! **Hobart Bros. Co., Box TB-78, Troy, Ohio**



Brics Portable Welder



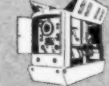
Generator-Welder & Power



Transformer Type A.C.



Weldmobile (Self-propelled)



AC-AC Welder, Power



AC-AC Welder, Power



Combination Welder & Power



Electric Motor Driven Welder



Welding Generator

**Hobart** "ONE OF THE WORLD'S LARGEST BUILDERS OF ARC WELDERS"

**HOBART  
 ARC  
 WELDING  
 ELECTRODES**



utmost care and consideration should be given to the selection of quality electrodes. Deposited weld metal made by Hobart Electrodes is uniform, free from porosity and other imperfections, giving an excellent weld surface of fine grain structure and are of high ductility and strength.

**Hobart Brothers Co., Box TB-78, Troy, Ohio**

Please send me complete information on items checked below. I am especially interested in knowing about the new Hobart Industrial AC Arc Welders.

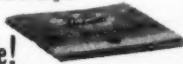
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FIRM \_\_\_\_\_

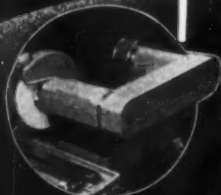
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Get your copy of brand new HOBART ARC WELDER CATALOG showing newly developed machines! It's FREE!



# Designed for **EFFICIENCY**

TO PRODUCE MORE OF A GREATER VARIETY  
THRU EASE OF PRECISION SET UP AND OPERATION



External Bracket



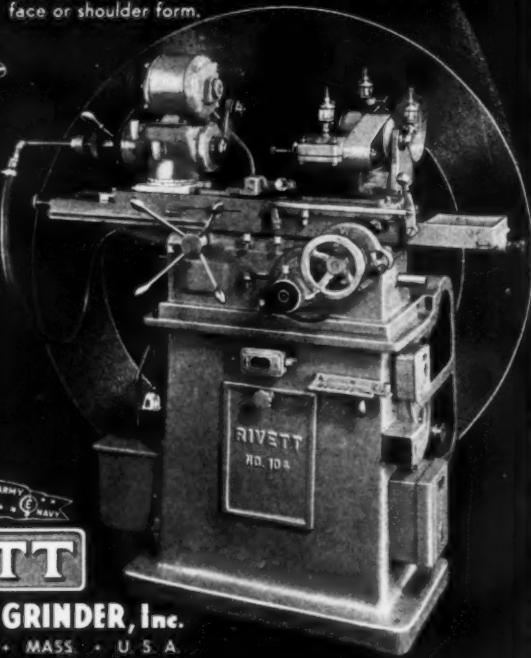
Internal, External Turret

## RANGE

Internal spindles of suitable design and speed may be selected for hole grinding up to approximately 3" diameter and 4" length.

External bracket with 7" x 1/2" wheel may be used for on-center or chucked work up to approximately 3" diameter.

Turret for concentric grinding of hole or outside surface is limited to such work as may be chucked.



# RIVETT

**RIVETT LATHE & GRINDER, Inc.**

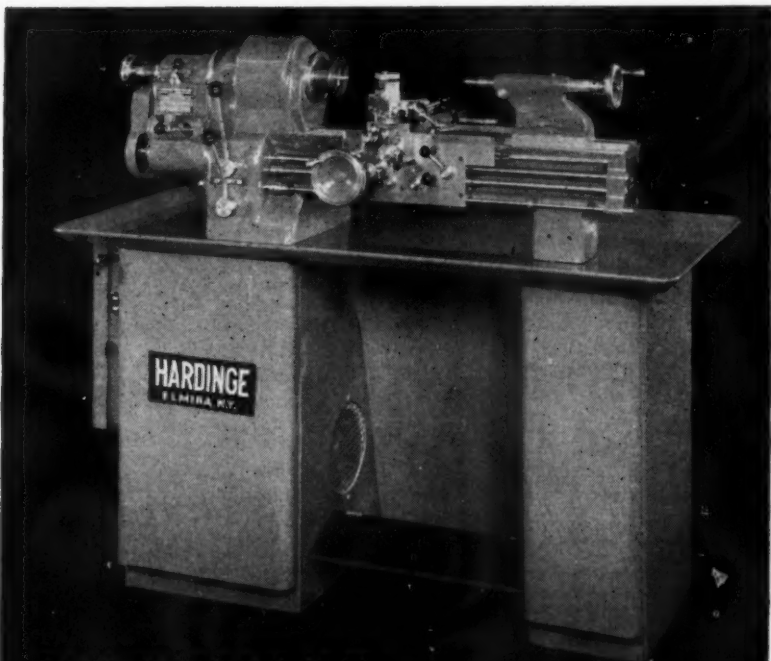
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Write for Bulletin 104.

**HARDINGE**  
ELMIRA, N.Y.

## High Speed Precision Tool Room Lathe

**SAVES TIME . . . SAVES MONEY**



Time and money can be saved when tool room collet work of one-inch diameter or less is not done on heavy lathes. Here is how:

**SAVE TIME** — by avoiding use of slower machines designed to produce large work.

**SAVE MONEY** — by prevention of under-capacity production on more expensive machines which consume excess power and waste floor space for size of work involved.

HARDINGE High Speed Precision Tool Room Lathes can save both time and money and return profits proportionate to machine investment, because it is the proper size tool room lathe for collet work one-inch or less. Furthermore, HARDINGE assures extreme accuracy, high spindle speeds and ease of operation.

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"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE"

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# ARMSTRONG



## ARMSTRONG TOOL HOLDERS *are more efficient*

It takes years of development, improvement and practical experience to create and perfect a line of tools. This has been the specialized work of ARMSTRONG, a contribution to machining efficiency which they have carried on continuously for 59 years.

Starting with the Armstrong Principle of inserted cutters in permanent tool shanks that "Saves: all forging, 70% Grinding and 90% High Speed Steel", they created this unique method of tooling which has

changed shop practice today in over 96% of the machine shops and tool rooms. And, today, in a specially built plant, equipped with every modern facility and staffed with experts in each phase of tool making, this work goes on.

To you, as a tool user, here is always one safe principle—specify ARMSTRONG TOOL HOLDERS for every operation on lathes, planers, slotters and shapers, for turret lathes and screw machines. They are cataloged and stocked by all leading supply houses.

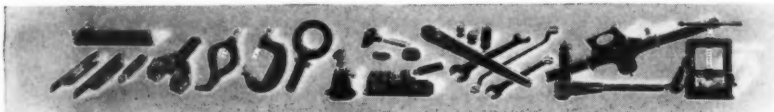
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"The Tool Holder People"

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Published Monthly

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JULY, 1948

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*"as COOL as  
a cucumber"*



with  
**Anti-Scoring  
LUBRICANT**

Actual tests prove that CMD Anti-Scoring Lubricant will not break and cause scoring or metal-to-metal contact—even under pressures exceeding 50,000 pounds per square inch. Reduce operating costs—eliminate unnecessary waste and danger—give your tools and equipment the best anti-scoring protection available—CMD Center Point lubricants. Write for FREE SAMPLE kit and catalog!



#### **CMD Helical Groove LATHE CENTER**

*(shown above)*

gives top performance—under severest shop conditions. The groove carries oil right to the point. Center lasts longer—work stays cooler.

## MAIL COUPON NOW!

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**Dept. 78B, 1928 West 46th St., Chicago 9, Ill.**

Without obligation please send us a free sample kit of one tube of CMD Center Point Lube and one tube of CMD Center Point Oil. Also, send Catalog describing CMD Helical Groove Centers.

NAME.....

FIRM NAME.....

ADDRESS.....

# FULMER

Saved 90%  
Machining Time  
Improved Surface  
Finish 900%



## ON THIS PART →

for CINCINNATI PLANER COMPANY

This bull pinion, a part used on Cincinnati "Hypro" Planers, is a 4145 forging, having two 6" long bores, in line, 4 1/4" in diameter. The bores were formerly reamed, removing .005" of metal, with tolerance of .001" in 10 minutes. Surface finish equalled 100 micro-inches. By changing from reaming to honing on a Fulmer Honing Machine, only one minute is required to remove .005" of metal to a tolerance of .0002"—and a surface finish of 10 micro-inches is obtained.

This one example is typical of the savings in production time and labor, and the improvement in piece quality that is made possible by Fulmer Honing Machines. If your production involves precision processing of cylindrical bores ranging from 1/2" to 30" I. D., investigate Fulmer Machines. Write today, describing your specific work requirements, for complete data on Fulmer Honing Machines adaptable to your production. There is no obligation.

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# FULMER

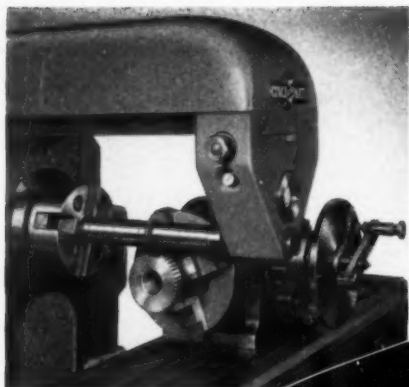
**C. ALLEN FULMER COMPANY**


1242 First National Bank Bldg., Cincinnati, Ohio

**PRECISION PRODUCTION EQUIPMENT**

★ Honing Machines • Rod Boring • Piston Ring Lappers

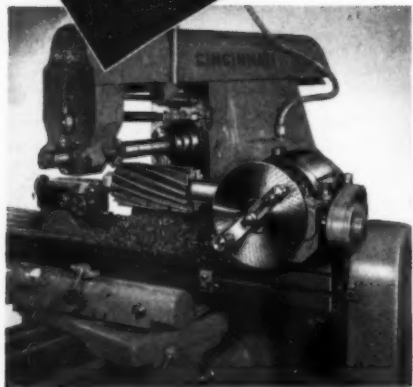
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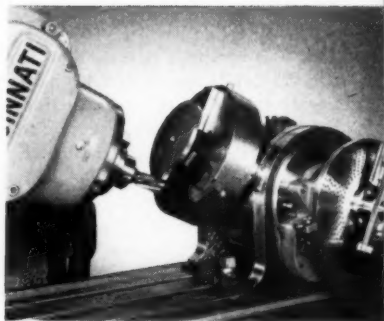

 Milling the slots in an adjusting nut. You don't need a variety of fancy milling operations to justify a CINCINNATI Dividing Head, but when you do want super-precise accuracy, you'll get it.


Not fussy about the job it does

...but




 Milling the flutes in a plain helical cutter. CINCINNATI Dividing Heads are ruggedly constructed for work of this type. Swivel block which carries the spindle is clamped on its entire circumference.




 Milling a cam. The setup includes a CINCINNATI Dividing Head with a 3-jaw chuck and a CINCINNATI Heavy Vertical Milling Attachment.

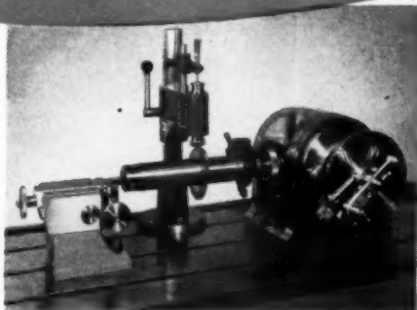


● Handy man for milling machines. CINCINNATI Dividing Heads are not a bit fussy about the work assigned to them. They handle prosaic jobs like milling slots in adjusting nuts; heavy duty work like milling worms or the flutes in cutters; accurate and intricate jobs like bevel gears. Light cuts or heavy cuts, you can depend upon CINCINNATI Dividing Head's high degree of accuracy. ¶ These illustrations are typical of the many ways in which CINCINNATI Dividing Heads can handle work in your shop. They are not restricted to universal millers; they are equally at home on plain and vertical milling machines and drill presses. And your inspectors will find 1001 uses for them in checking accurate work. ¶ CINCINNATI Dividing Heads are built in 10", 12" and 14" sizes; all have 40 to 1 ratio. Complete data may be obtained by writing for catalog M-1016-2.

**mighty particular about accuracy**



Here a CINCINNATI  
Dividing Head is  
employed to check the  
curvature of a cam.



## THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES  
FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

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*Get the facts on...*

THE

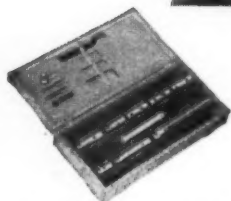
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**THE SINGLE  
BORING BAR  
for all your boring**

For use on any Boring, Milling, Turret, or Automatic Screw Machine, and designed for practically all boring in manufacturing operations.



For the first time, rigidity in an adjustable bar is assured by ADJUSTO's special-design dovetailed section in the head. This section, operated by #10 ground and hardened screw, slides on ground and polished surfaces thus eliminating inaccuracies caused by wear.



- 1 MICROMETER ADJUSTMENT....accurate to .0001"
- 2 ANY LENGTH BORE.....up to 21"
- 3 ANY DIAMETER BORE.....up to 16"
- 4 USES STANDARD SQUARE TOOL BITS

*Your inquiries welcome—Send for full particulars*

Each Adjusto set is packaged in convenient plywood container designed for ease in handling and safe storage.

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822 FRICK BUILDING  
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the clean-cut way!



This  $\frac{3}{4}$ -inch shear is cutting plate rapidly and accurately with a sharp reduction in cost over other methods.

The 36 or 48-inch micrometer back gauge is a valuable time saver for cutting plate to size. To accommodate extra long plates, the Cincinnati back angle swings up out of the way.

When it is desirable to shear to a scribed line, the Cincinnati light beam gauge positions the plate rapidly and accurately.

Plates roll easily across Cincinnati tables on ball transfers, cutting handling time and physical effort.

Cincinnati inclined rams present the corner of the knife to the work and shear straight and clean.

Cincinnati features ensure quick handling, accurate work and low shearing costs.



## THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES



## With Two DI-ACRO BENDERS

A difficult production problem of forming two bends in a long length of tubing was solved by "teaming up" two DI-ACRO Benders as illustrated. This dual-forming arrangement saved installation of special machinery. Two accurately formed bends are obtained in one operation—without distortion of the tube and at a cost competitive to power operated equipment. More than 300 pieces are completed per hour—600 individual bends.

### "DIE-LESS DUPLICATING" Often Does it Quicker WITHOUT DIES

This is but one example of how DI-ACRO precision machines—Benders, Brakes, Shears Notchers, Rod Parters, Punches—can accurately and economically duplicate a great variety of parts, pieces and shapes, without die expense. Write for catalog—"DIE-LESS DUPLICATING".

◀ DI-ACRO is pronounced "DIE-ACK-RO".



**O'NEIL-IRWIN mfg. co.**

314 EIGHTH AVENUE • LAKE CITY, MINNESOTA



# NEW, VERSATILE **25** TON MULTIPRESS\*



**IT'S THE PRESS YOU  
DEMANDED WE BUILD!**

## SPECIFICATIONS

|                                  |         |
|----------------------------------|---------|
| Tonnage Cap . . . . .            | 25 tons |
| Stroke . . . . .                 | 15"     |
| Daylight . . . . .               | 25"     |
| Throat Depth . . . . .           | 12"     |
| Approach Speed (Max.) . . . . .  | 450 ipm |
| Pressing Speed . . . . .         | 210 ipm |
| Return Speed . . . . .           | 400 ipm |
| Height 95", Width 32", Depth 54" |         |

**ADAPTABILITY**—The new 25-ton capacity Multipress has been designed for operations requiring the flexibility of control featured in the smaller models of the Multipress, plus the added advantage of higher tonnages.

**CONTROL**—Furnished in either manual or automatic types with regulation for

ram approach speed, stroke length, pressing speed and tonnage.

**VERSATILITY**—Easy adjustment of all control features makes for rapid interchange of tooling and fixtures.

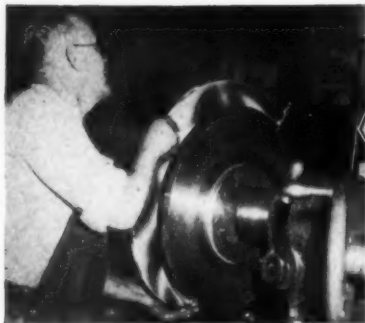
**HIGH SPEED**—Although approach speeds are faster than the standard 4-ton Multipress, pressing speed may be regulated for slow controlled operation. Write for details.



**DENISON**  
EQUIPMENT - APPLIED  
*Hydraulics*

\* REG. U. S. PAT. OFF.

The **DENISON** ENGINEERING COMPANY  
1184 Dublin Road • Columbus 16, Ohio



## TUMICO Tubular Micrometers Quick and Easily Gage Work Diameters to 96"

**Light Tubular Structure  
Cuts Operator's Fatigue in Gag-  
ing Large Turned Diameters—"Feath-  
er-Touch" Feel Insures Precision  
Measurements.**

Precision gaging of work diameters to 96" is both practical and possible with Tumico Tubular Micrometers. Because these micrometers are light in weight, accurate measurements are easily and quickly made on large diameters without tiring the operator. "feather-touch" feel insures precision gaging impossible with heavy solid frame micrometers or calipers. Tumico instruments are designed to reduce measuring time on all types of close work.

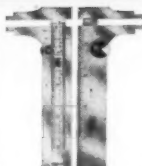
### MORE TIME SAVING—PROFIT PRODUCING TUMICO PRODUCTS FOR YOUR NEEDS.



**1. Tumico Tubular steel Adjustable Limit Snap Gages** are up to 50% lighter in weight than solid type units and offer unequalled "feather-touch" feel and balance.



**Series T** fixed anvil type in size 0" to 96" and in **Series M** mandrel type in sizes from 0" to 106" both in sets or combination. Embodied in these micrometers are such important structural features as hardened and ground spindles, ground and lapped spindle threads, special alloy steel vacuum sealed frames, triple plated with copper, nickel and chrome and easy to read numerals.



**3. Tumico Pocket Slide Calipers** accurately measure both outside and inside diameters. Deep, clear, calibrations in 32nds and 64ths with latter numbered for rapid reading make these desirable for precision work. Readings in English or metric.

### Write Today

—for further information about Tumico Precision Measuring Instruments for all standard and special requirements.

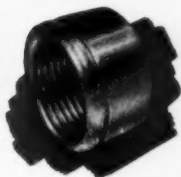
TRADE  
**TUMICO**  
MARK



**4. Tumico Thrift Micrometers** are economically priced units having drop forge steel frames, hardened anvils and spindle tips. They are available with ratchet stop and lock ring, or Vernier scale in size 0" to 6".

**TUBULAR MICROMETER CO.**  
ST. JAMES, MINNESOTA, U.S.A. MILWAUKEE BRANCH  
PLANKINTON BLDG.

# A Finished Piece Every 2.5 Seconds..



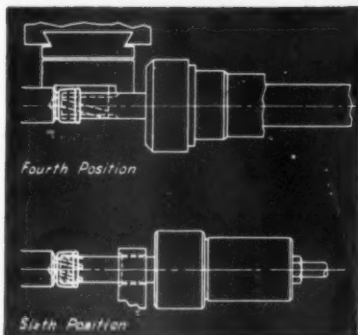
**Thanks to • High Speeds • Heavy Feeds • Carbide Tooling  
... on a NEW BRITAIN AUTOMATIC**

"You can't drive a spike with a tack hammer." You just can't handle the high speeds and heavy feeds that, with carbides, mean high production unless you have a machine that is built from the ground up to do the job.

Here's a case where a carbide-tooled New Britain Model 601 automatic operating on aluminum at spindle speeds of 3352 RPM, with a forming SFM of 1098, produces 1433 finished pieces per hour in eight operations.

Carbides can mean new standards in speed and economy in your plant. To help you attain them New Britain makes the only automatic screw machines designed with the power, speed, weight and rigidity to get the full benefit with carbides.

After forming and drilling in the first three positions a carbide skiving tool with no back clearance burnishes the piece eliminating a secondary polishing operation and readying the part for immediate plating.



Tapping is done in the fifth position. Breaking through the  $\frac{3}{4}$ " radius, a finish reamer cuts off in #6. This leaves a complete radius blending in with the back face as specified by the manufacturer. The piece is stripped from the reamer on drawback stroke. Ordinary cut-off methods would have required secondary grinding.

**Write for descriptive literature on  
new Models 601 and 602**

*At left: Easily accessible cams, directly behind cross slides, eliminate deflection and permit heavy forming cuts of carbides.*



## NEW BRITAIN

*Automatics*

**THE NEW BRITAIN MACHINE COMPANY  
NEW BRITAIN-GRIDLEY MACHINE DIVISION  
NEW BRITAIN, CONNECTICUT**

748HF2

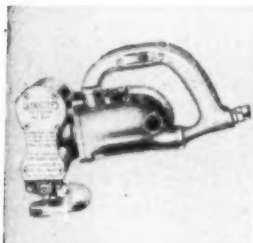
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# Tools for Odd Jobs

## Maintenance, Production

These three Stanley Electric Tools make odd jobs more profitable, and cut corners on maintenance and production work.

*See your industrial distributor or write for literature.*



**No. 214 Unishear**—Cuts 14 gauge and lighter cold rolled steel. Follows a line, either straight or curved. Easier to use than snips... and much faster.



**No. 24 Electric Drill**— $\frac{1}{4}$ " capacity—for drilling in metal, wood and plastics. Powerful, small in size, for use in hard-to-get-at places... in awkward positions.



**No. 266 Bench Grinder**— $\frac{1}{4}$  H.P., 6" wheels. Full ball bearing sealed against dirt. Adjustable tool rests. Extended frame gives large working area around wheels.

Stanley Electric Tools, 512 Myrtle St.  
New Britain, Conn.

THE GREATEST NAME IN TOOLS

# STANLEY

Reg. U.S. Pat. Off.

**HARDWARE · HAND TOOLS · ELECTRIC TOOLS**

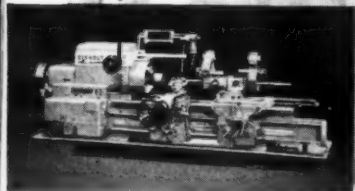


# GISHOLT TURRET LATHES



**INSTANT  
SPEED  
CHANGES**  
at the  
**FLIP**  
of a  
**FINGER!**

**No manual gear shifting.**  
**Just touch this knob for**  
**quick high-low or low-high**  
**spindle speed shifts.**  
**A great timesaver—**  
**Boosts Production!**



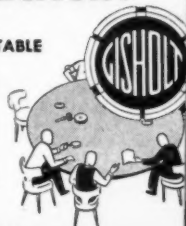
Speed changes (6-1 ratio) are made by hydraulically operated clutches. This standard feature on all Gisholt Turret Lathes is a big advantage in drilling-tapping, boring-reaming, and turning-threading operations.

**GISHOLT MACHINE COMPANY**

Madison 10, Wisconsin

## THE GISHOLT ROUND TABLE

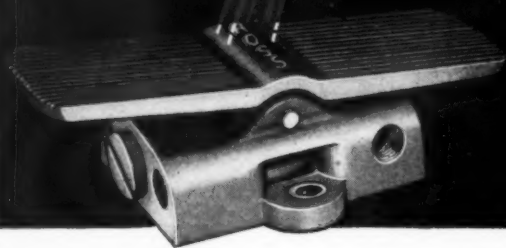
represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



# SNAP and STAMINA!



NEVER BEFORE in this type of valve—ruggedness, reliability, low cost and low maintenance, PLUS the choice of foot or hand lever control. That's Ross' answer for small air cylinder use on machines where easy operation, continuous high production and compactness are "musts". It's Ross quality, of course, precision-machined brass and stainless steel construction, yet at a price you can't afford to pass up.



Available

1/4" 3-way

1/4" 4-way

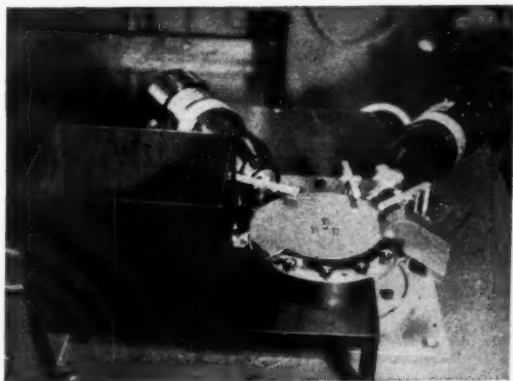
Your choice foot  
or hand lever.

# ROSS

## Operating VALVE CO.

120 E. Golden Gate Ave., Dept. 141

Detroit 13, Mich.



## Drilling, Tapping and Re-Tapping Set-Screw Holes In Plastic Knobs With One Handling

The great possibilities for time-saving through the use of Govro-Nelson Automatic Drilling Units is illustrated in the above 3-unit automatic set-up for drilling, tapping and de-burring set-screw holes in plastic knobs.

One unit drills the set-screw hole through the plastic and aluminum insert with a combination drill and counter-bore. A second unit then taps the aluminum insert for the set-screw, after which the third unit (below indexing table) retaps the center hole to de-burr.

Let us show you how you can simplify your complicated drilling and tapping operations with Govro-Nelson Units, thereby reducing your production costs.

**WRITE FOR**  
*Literature*

**GOVRO-NELSON CO.**

*Machinists of Precision Parts  
for 25 Years*

1933 Antoinette, Detroit 8, Mich.

*Automatic*

**DRILLING UNIT**

# AUTOMATIC CUTTING-OFF

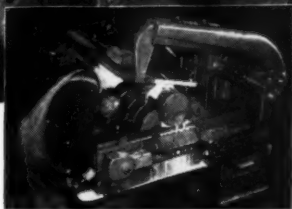
For Lower Costs of Finished Parts



Along with hundreds of other well known producers, ACF-Brill Motor Company utilizes the production capacity of Racine Automatic Machines to lower the cost of finished parts.

Regardless of the size, kind or shape of your stock, the great cutting capacity and precision work of these machines help you lower the cost of your product. Accurately cut blanks require less subsequent machine work. Fully automatic operation relieves your operators for other jobs.

Full hydraulic operation and control permits extremely simple but heavy, rugged design. This insures a low operating cost—it is the main reason Racine equipment is



PHOTOS COURTESY ACF-BRILL MOTOR CO  
PHILADELPHIA, PA.

noted for its continuous performance, without down-time loss of production.

Get the full story on Racine Machines — single purpose and automatic. Sizes from 6" x 6" to 20" x 20". Ask for catalog 12. Write today. Racine Tool & Machine Co., 1754 State St., Racine, Wis.

## RACINE Hydraulic Pumps and Valves

Variable Volume, 12 - 20 - 30 g.p.m. Pressures to 1000 p.s.i. 4-way and other control valves 3/8" to 1 1/2". Data on request.



# RACINE

STANDARD FOR QUALITY AND PRECISION

## The CONE AUTOMATIC MACHINE COMPANY



sees many

# GOOD THINGS AHEAD

### It is reported that . . . . .

National Bureau of Standards has a new magnetic clutch, which is intended primarily for immediate use in servo mechanisms, but has possibilities in many fields including the automotive. It consists of a driving and a driven plate immersed in oil, in which are suspended iron particles that can be magnetized or demagnetized.

get ready with CONE for tomorrow

Carnauba wax now has a rival in a substance extracted from Mexican sisal fiber, according to Armour Research Foundation.

be ready with CONE for today

Dow Chemical Co. has found a way to electroplate magnesium by first coating the metal with zinc.

get ready with CONE for tomorrow

Standard Railway Equipment Mfg. Co. has perfected a machine for truing car wheels without removing them from the trucks.

be ready with CONE for today

Greyhound Corporation's new 50-passenger, two-level bus has a crash-proof gas tank made by Firestone Tire & Rubber Co.

get ready with CONE for tomorrow

Electronic vulcanization has become a standard production process at B. F. Goodrich Co.

be ready with CONE for today

Lustron Corp. of Columbus, Ohio, has a porcelain enameled steel prefabricated house which they expect to be producing at the rate of 3700 units per month by next October.

get ready with CONE for tomorrow

Ford's light car will be made and sold in France.

Beech Aircraft Co. promises a new automobile with air-cooled engine and electric drive to all four wheels.

be ready with CONE for today

The first Conomatic multiple spindle lathe was built to accommodate carbide tipped tools almost two decades ago. The exclusive frame design of the machine remains practically unchanged today.

get ready with CONE for tomorrow

"Durisol" is the name of a new building panel made of wood shavings and portland cement by Durisol, Inc., 420 Lexington Ave., New York City.

Allis-Chalmers' new low-priced tractor pushes the tools instead of pulling them so that the farmer can see his work.

be ready with CONE for today

B. F. Goodrich Co. has announced that some of its extruded shapes are being vulcanized electronically. Time has been cut in some cases from 1½ hours to two minutes.

get ready with CONE for tomorrow

E. I. duPont de Nemours & Co. has granted licenses to 50 paint manufacturers to make its metallic lacquer finish.

be ready with CONE for today

The new Oldsmobile engines will have a compression ratio of nearly 8 to 1.

get ready with CONE for tomorrow

Kaiser-Frazer Co. announce that they are experimenting with magnesium automobile wheels.

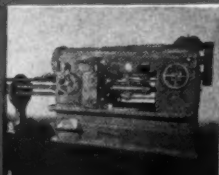
FOLLOW THESE PAGES FOR NEWS OF PROGRESSIVE PRODUCTION



## Profitably CONOMATIC

TWO of these ball-bearing inner races are turned from SAE 52100 tubing, 3½" O.D., 1¼" I.D., in 11 seconds on the 6-spindle Conomatic.

Ask your CONE representative to show you our new color motion picture



# CONE

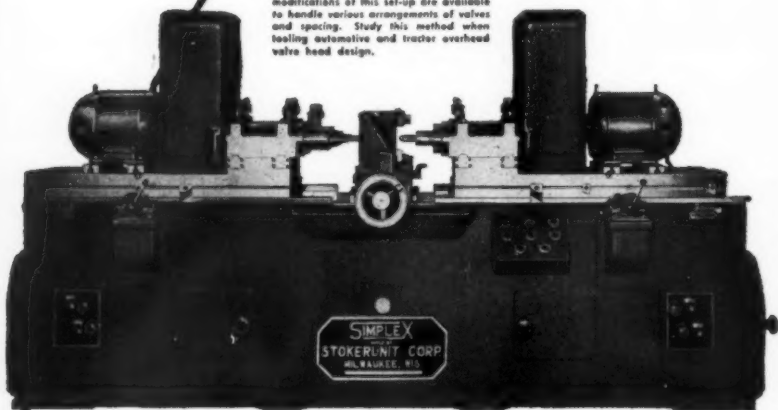
AUTOMATIC MACHINE CO., INC. ★ WINDSOR, VERMONT, U.S.A.

# SIMPLEX

The life and efficiency of a gasoline engine depends much upon the accuracy of valves and valve guides. One progressive manufacturer found that by placing the cylinder heads for an overhead valve engine in a simple cross-sliding fixture, semi-finish boring one side and precision boring the valve guides and valve seats from the other, he achieved the finest precision and engine performance.



This SIMPLEX 2U 2-way Precision Boring Machine, with three  $\frac{1}{2}$  inch spindles on each side and cross-sliding fixture, bores two intake and two exhaust valve guides and seats in a four step cycle. Many modifications of this set-up are available to handle various arrangements of valves and spacing. Study this method when tooling automotive and tractor overhead valve head design.



## Precision Boring Machines

**STOKERUNIT CORPORATION**

**SIMPLEX Machine Tools Division**

4530 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools



## IT TAKES SOMETHING EXTRA TO BE A *Specialist!*

Just as the success of a building project rests upon a properly surveyed foundation . . . so does the established quality of BATH standard and special size taps, depend upon uniform heat treatment. All BATH taps are toughened by hardening and tempering **BEFORE** being ground from the solid!

Controlled production through uniform heat treatment is a prime factor in grinding threads with the correct degree of hardness, providing a cutting edge that insures maximum performance and minimum wear.

BATH taps are engineered — right from the start — to give EXTRA service! See your BATH representative or write direct about your tap problems.

(Transportation is paid to your plant on all Bath products)

# JOHN BATH CO. INCORPORATED

14 Grafton Street  
WORCESTER 8, MASS.

GROUND THREAD TAPS • PLUG AND RING TAPS • INTERNAL MICROMETERS

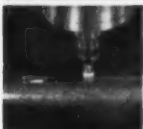
## NELCO Carboly-Tipped 3 FLUTE END MILL

did this job *in 1/16th the Time*

### New NELCO 3 FLUTE CARBOLY-TIPPED END MILL:



- Plunges into solid metal and mills. Will bore hole and mill in one operation.



- Eliminates Chatter—providing smoother cutting—a better job in astonishingly reduced time.



- Mills so smoothly that a finished cut is either not required at all, or to a much lesser degree.

- Stays sharp much longer—doesn't require resharpener as often.

- Provides Cooler and Freer Milling—More CHIP room decreases the chance of work overheating and twisting.

This tool is manufactured for use on all types of alloy steel, cast iron, brass and bronze. Sizes ranging from 1/8" to 2" diameter.

Write for additional detailed literature.

# NELCO



## TOOL CO., INC.

For That EXTRA EDGE In Production  
266 Center Street Manchester, Conn.

Any One Of These Well Known Distributors Will Be Glad To Help You

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Toledo—J. W. Mull, Jr.  
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York, Pa.—L. A. Benson Co., Inc.

### and did it *Better!*

One of the objective tests used by Nelco Engineers was the cutting of a "keyway". (Results illustrated below) End Mills compared were high-speed steel and Nelco's new Carboly-tipped 3 FLUTE. Material was S.A.E. 1095 steel shafting. End Mills were 1/2" diameter: a 3 H.P. milling machine was used in both cases: 2400 R.P.M. and 14" per minute feed was used for the Carboly: 609 R.P.M. and 3" per minute feed for the high-speed steel.

#### OPERATIONAL RESULTS:

**2 MINUTES**—To complete the job using high-speed steel and mill.



#### NOW COMPARE NELCO RESULT!

**20 SECONDS**—Job completed using Nelco's new Carboly-tipped 3 Flute End Mill



NOTE: ABOVE TEST PHOTOS UNRETOUCHED

**SAVE** Hundreds of Valuable **PRODUCTION HOURS** By Giving The **NELCO FIELD ENGINEER** A Few Minutes Time!

For more complete details of this and other tests conducted by Nelco, write or see your local Nelco Field Engineer.

NELCO also manufactures a complete line of Carboly-Tipped Milling Cutters, End Mills, and Twist Drills.



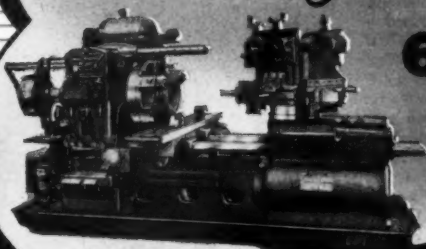


# P&J

## AUTOMATIC

# Turret Lathe

## 6-DRE



The 6DRE series of automatic turret lathes are provided with 4 automatic changes of spindle speed, 3 selective automatic changes of feed and automatic binding of turret after indexing. Other features are direct slide action, and a motor driven constant rapid traverse motion to cross slide and turret slide.

P & J Methods Engineers are available to assist you in taking advantage of the production possibilities of this and other machines in the P & J line to cut your costs of machining duplicate parts.

**Potter & Johnston  
Company**

**Pawtucket, R. I.**

*Subsidiary of*

**Pratt & Whitney**

**division Niles-Bement-Pond Co.**

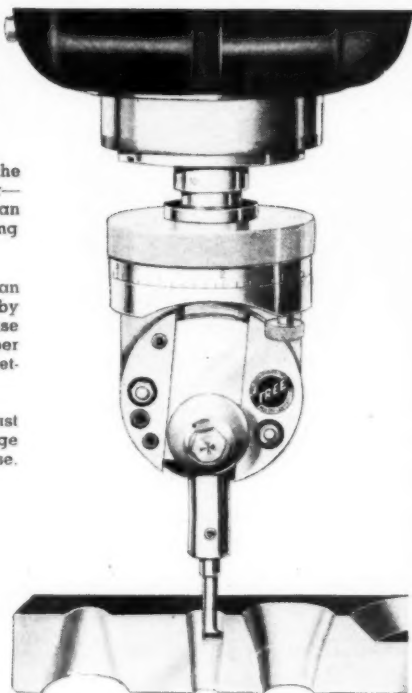
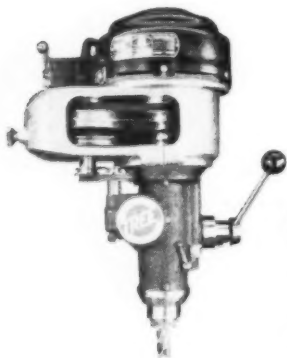
# CUT TAPER-HOLE COSTS

## With the TREE Taper-Boring Tool

Here's a revolutionary boring tool for the milling machine, jig borer and boring bar—that not only bores taper holes, but can also be used for facing, straight boring and outside turning.

Expensive, non-productive set-up time can be cut from hours to a few minutes by using a TREE Taper-Boring tool because it eliminates the need for special taper tools and time-consuming, elaborate set-ups.

Ideal for boring metal patterns, die cast dies, rubber or plastic molds, drop forge dies, etc. Speedy and economical to use.



### TREE

### UNIVERSAL MILLING HEAD ATTACHMENT . . .

All Angle Milling, Drilling, & Boring.  
Compact Design.  $\frac{3}{4}$ " Collet Capacity.  
4" Quill Travel. Power Feed Eight Speeds—  
140-3500 RPM or 210-5200 RPM. Hardened & Ground  
Spindle & Quill. Enclosed Micrometer. Depth Stop.

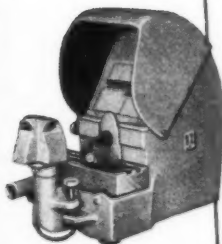
For Full Information—Write Dept. B

**TREE TOOL AND DIE WORKS**  
1600 JUNCTION AVENUE RACINE, WISCONSIN

The NEW Jones & Lamson BC-7 Bench Optical Comparator offers you a choice of three different table assembly combinations. This enables you to choose the model best suited to your needs, and obtain . . . *at lowest cost . . . the finest in Optical Comparators.*

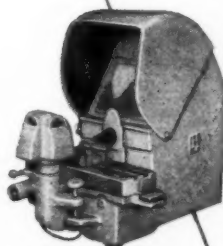
These models are the outcome of more than twenty-five years experience in the field of inspection by optical projection. They are designed to cover an almost unlimited range of inspection work — from precision products of the tool room through a diversity of industrial parts and products requiring a method of inspection that is at the same time accurate and rapid.

Our engineers are inspection specialists, their knowledge of holding fixtures, handling methods and suitable Comparator equipment, qualify them to study your inspection problems and make recommendations that will improve your profit picture. They have for others. Call, write or wire for their service today.



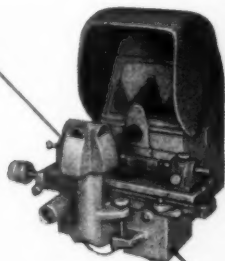
**New MODEL BC-7A** ★

This Model has a 12" plain table. It is used for comparing the magnified shadow of an object with a master outline. Commonly used for inspecting such parts as knitting needles and sinkers on a production basis, it can handle objects up to 3" diameter, at magnifications ranging from 5 to 125.



**New MODEL BC-7B** ★

This Model has a 14" table that can be compounded for inspecting objects with helices. It is for rapid and accurate inspection, by comparison, of screw threads and other irregular shaped parts. Objects up to 3" diameter and 11" between centers can be inspected at magnifications from 5 to 125.



**New MODEL BC-7C** ★

Standard Bench Model with 16" table equipped for making lateral measurements. The table can be compounded for projecting objects with helices. Objects up to 3" diameter and 11" between centers, can be inspected at magnifications ranging from 5 to 125. This Model is used to inspect a great variety of objects, such as: hobs, taps, small tools, threaded parts, calculating machine parts, automatic telephone parts, instrument gages, dental instruments and thousands of others.



**JONES & LAMSON MACHINE COMPANY**  
Springfield, Vermont, U. S. A.

Manufacturers of: Universal Turret Lathes • Pay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers • Ground Thread Flat Rolling Dies

# Jones & Lamson

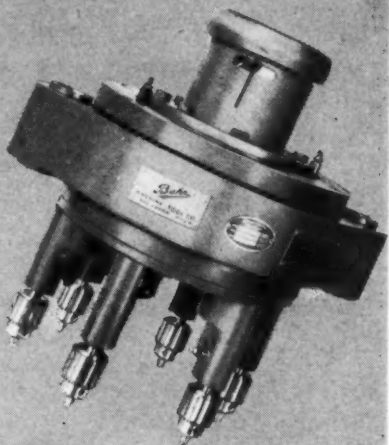
## OPTICAL COMPARATORS

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SPECIFY  
*Buhr*

**MULTIPLE SPINDLE  
DRILLING AND  
TAPPING HEADS  
FOR  
PRODUCTION**

**BUHR BUILDS ALL  
TYPES OF SPECIAL  
FIXED CENTER AND  
ADJUSTABLE  
MULTIPLE HEADS  
FOR HIGH PRODUCTION  
UNDER SEVERE  
OPERATING  
CONDITIONS**



Buhr Standard Adjustable Drilling and Tapping Heads are engineered and built to deliver high production at low unit cost. Fully adjustable, 2 to 8 spindles, for short or long runs. Rapid set up, models for all presses. Anti-friction bearing throughout. All gears are shaved, spline broached and induction hardened. Shafts and spindles splined.

Model 06-1-2 shown with No. 2 Jacobs Chucks also is available with spindles for Buhr Collets or with No. 1 Morse Taper. Drill capacity is  $\frac{5}{16}$ " cast iron, minimum between center,  $1\frac{1}{2}$ ". Buhr steel-bushed guide-bar bosses are available for precision alignment with fixture.

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**BUHR MACHINE TOOL COMPANY**

**Dept. 10 DH**

**ANN ARBOR, MICH.**

# WE BUILD PRESSES FOR THE JOB NOT BY THE TON'

...K. R. Wilson

Union Steel Chest uses KRW Presses to do the work of heavier, more expensive equipment ... Do it as fast, at greatly

*Reduced Cost!*

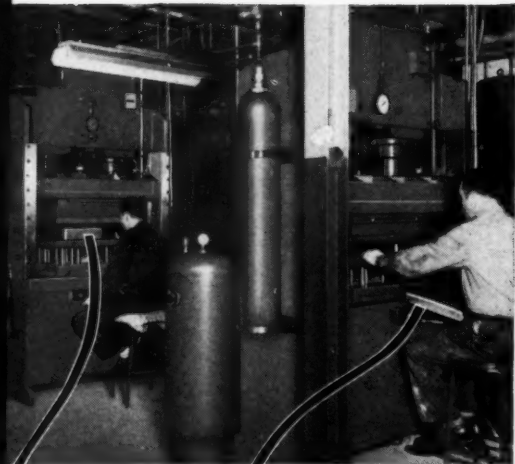
● Many a KRW Press user discovered long ago that a large percentage of forming, drawing and stamping work does not require the use of large, heavy-tonnage presses with their accompanying high initial and operating cost. Union Steel Chest of LeRoy, N. Y. is excellent proof of this statement.

Production records, in a variety of industries, show that KRW Presses greatly reduce costs. First investment is very low, operating costs are still lower. In one instance, the purchase price of a KRW Stamping Press was less than the foundation cost for heavier equipment.

KRW Presses are highly flexible...they can be built in varying bed lengths. KRW Presses are available as either Gap, Open End or Closed End Types. Tonnage pressures vary from 25 to 100 tons. Because they are hydraulically operated and not mechanically driven, they are quiet and vibrationless in operation. Platens can be stopped and reversed at any point in their travel.

Let us know your needs...we are fully equipped to engineer our equipment to handle your work. In the majority of cases, we can make delivery in a fraction of the time required for other type presses. Let us hear from you.

ALL TYPES OF DIES. We are equipped to engineer and build dies to meet your specifications. All we need is available technical data, blueprints and, where practical, a sample piece of work. We'll quote prices and delivery date.



● Illustrated are two KRW 100-ton presses in plant of Union Steel Chest Corp., LeRoy, N. Y. making 3 and 4-inch draws for top and bottom sections of utility bus shown on left.



## QUIET...

IT WOULDN'T WAKE A BABY. Easy, even hydraulic pressure does the work. No jarring impact as the die bottoms. No shock to the worker to lessen efficiency.



## DEFLECTION NIL...

NO SWATBACK PLATENS TO WORRY ABOUT. Where pressures require it, bed rails, platens and head are trussed and ribbed to eliminate deflection.



## VIBRATIONLESS...

GLASS OF WATER ON THE PLATEN, YOU'LL NEVER SPILL A DROP. That's how evenly pressures are distributed over the unit. That too, is another reason why dies last longer in a KRW.



**NAME YOUR NEEDS...WE'LL QUOTE PRICE  
AND QUICK-DELIVERY DATE...MAIL TODAY**

# K·R·WILSON

215 MAIN ST. · BUFFALO 3, N. Y.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please Send me complete information on new KRW  
100-ton Hydraulic Presses.

Name .....

Address .....

City and Zone ..... State .....

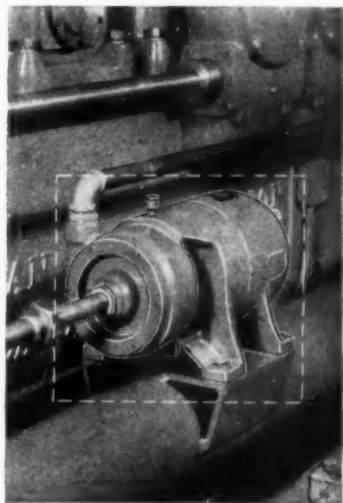


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Put these coolant pumps to work  
... coolants flow smoothly,  
uniformly, constantly.

Action is direct . . . simple . . .  
dependable! Tools last longer,  
work is better . . . your cooling  
problem is licked from the start.  
Economical! Easily installed . . .  
practically no maintenance.

Illustrated is Model AG6M mount-  
ed on heat exchange in tube mill  
manufactured by American Elec-  
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... numerous models available  
suitable for YOUR plant, too.



Write on your letterhead for  
FULFLO MECHANICAL  
DATA BOOK

THE



**Specialties Co., Inc.**  
BLANCHESTER, OHIO

# SET-UPS SIMPLE *as A-B-C on the* ACE Cutter Grinder

The Ace Grinder was designed to make your cutter sharpening easy. Set-ups have been simplified. The work is always in full view of the operator. Results show less fatigue for the operator, savings in set-up and grinding time, greater accuracy — *all* for a moderate investment. Available in two models — Standard for High speed and Heavy duty for Tungsten carbide and High speed cutters.



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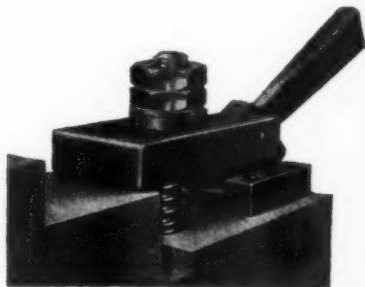
IMPROVE YOUR TOOLROOM  
IT'S THE BACKBONE  
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AUTOMATIC DRILL GRINDERS  
TOOL & CUTTER GRINDERS—DRILL  
POINT THINNERS—TEMPLATE  
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# SIEWEK



## *Siewek Tool Company* *Announces*

the appointment of two new exclusive stocking distributors

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New England States

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To expedite deliveries order direct from the following strategically located stocking distributors:

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Phone: Canal 6-1759  
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Phone: Cadillac 1935

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Fink Tool Company  
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H. Colby Rowell Co.  
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Phone: GE 1606  
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1025 Santa Fe Avenue  
Los Angeles, 21 Calif.  
Phone: VanDyke 2724

## *Siewek* TOOL COMPANY

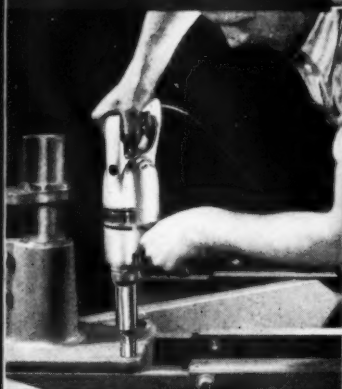
2862 E. GRAND BOULEVARD  
BRANCH OFFICE: CHICAGO — SIEWEK TOOL CO.  
224 S. MICHIGAN AVE. WABASH 5509 CHICAGO 4, ILL.



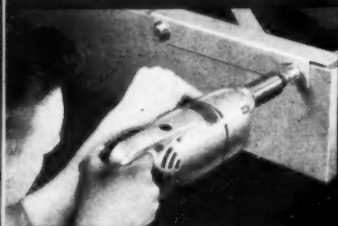
# NEW

# SKIL Drivers of every type CUT COSTS on ASSEMBLIES

The new SKIL 100 Series of compact drivers for fast assembly of machine parts is a new type of compact driver. It is designed for fast assembly of machine parts. It is designed for fast assembly of machine parts. It is designed for fast assembly of machine parts.



SKIL drivers are the perfect answer for fast assembly of machine parts. They are designed for fast assembly of machine parts. They are designed for fast assembly of machine parts.



SKIL drivers are the perfect answer for fast assembly of machine parts. They are designed for fast assembly of machine parts. They are designed for fast assembly of machine parts.

SKIL 100 Series Driver in assembly line. Designed for speed and safety, this operation is easy, even for women.

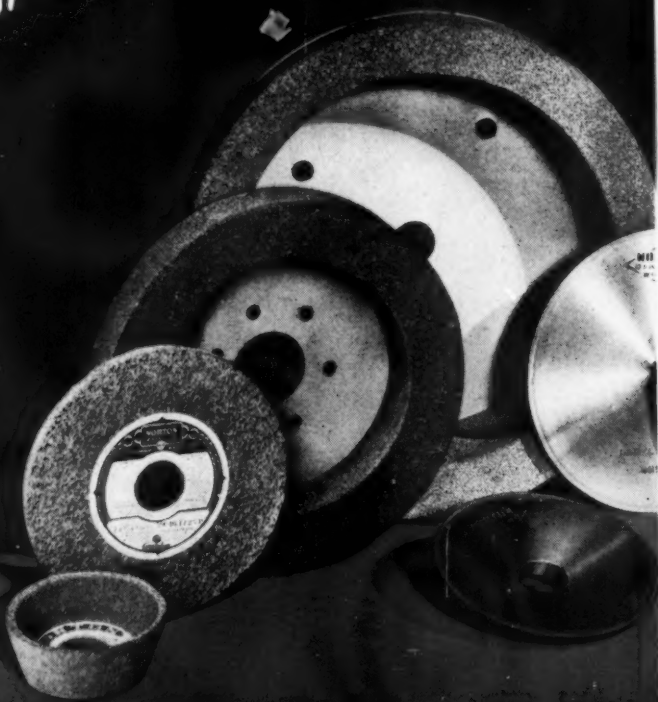


SKIL Drivers are the perfect answer for fast assembly of machine parts. They are designed for fast assembly of machine parts. They are designed for fast assembly of machine parts. They are designed for fast assembly of machine parts. They are designed for fast assembly of machine parts.

SKILCO, INC.  
2000 Union Ave., Chicago, Ill.  
Factory Branches in New York  
and Los Angeles  
All other SKILCO products are  
available in the U.S.A.

**SKIL** ELECTRIC  
**Tools**  
PNEUMATIC

*Have You Checked Up  
Recently on Your Carbide  
Tool Grinding Jobs?*



NORTON ABRASIVES

## Are You Using The Most Suitable Wheel on Each Grinder?

From the Norton line of diamond wheels, the most complete in the industry, you can select the correct bond for each of your carbide grinding jobs—cutting off blanks, sharpening single-point tools, grinding chip breakers, sharpening multi-blade cutters. And there's a complete line of Crystolon wheels, too, for your grinders using silicon carbide wheels.

Norton has always been first in diamond wheels—first with resinoid bonded in 1943, first with metal bonded in 1939 and first with vitrified bonded in 1944.

Let your Norton abrasive engineer or Norton distributor select the most suitable wheel for each of your carbide grinding jobs.

**NORTON COMPANY**



**Worcester 6, Mass.**

Distributors In All Principal Cities

W-1173

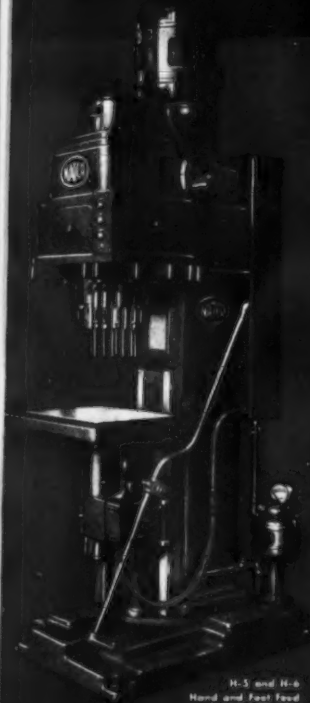


### HELPFUL INFORMATION

To aid you in obtaining more and better service from your carbide tools Norton has a 138-page handbook "Grinding Carbide Tools" and two 16mm. Kodachrome sound films. Write for the book and arrange for a showing of the films.

**NORTON ABRASIVES**

# H-5 and H-6 High Speed Multi Drillers and Tappers



H-5 and H-6  
Hand and Foot Feed

Available in Standard  
or Heavy Duty Models  
for work in small  
or medium sized parts



\* *In Cast Iron*



\* *In Wood*



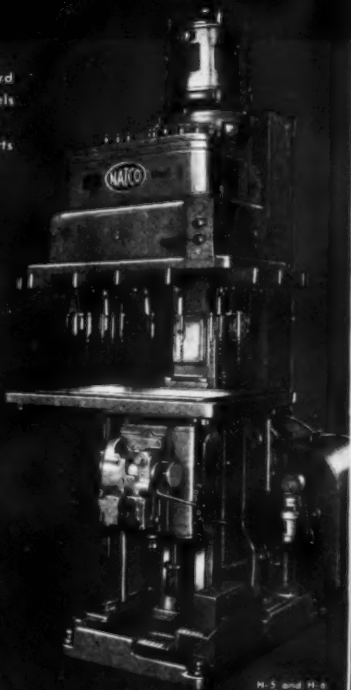
\* *In Steel*



\* *In Plastics*



\* *In Aluminum*



H-5 and H-6  
Hydraulic Feed

NATCO H-5 and H-6 Standard and Heavy Duty Multiple Spindle Drillers and Tappers make possible sensitive, high speed drilling and tapping in a wide range of materials at low cost. Features are the multiple spindle head, large working surface, quick change gears and speeds, vertical adjustment on spindles, and reversing motor drive. Available with hydraulic or hand and foot feed. Air operated rotary table available extra. Check details on these machines. Write for Bulletin 248.

\* WRITE FOR ACTUAL PRODUCTION FIGURES ON THESE PARTS

NATCO DRILLING, BORING, TAPPING  
AND FACING MACHINES



NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Ind., U. S. A.  
Branch Offices: 1809 Engineering Bldg., Chicago • 409 New Center Bldg.,  
Detroit • 1807 Elmwood Ave., Buffalo • 2902 Commerce Bldg., New York City

*Call a Natco Field Engineer*

# BAKER

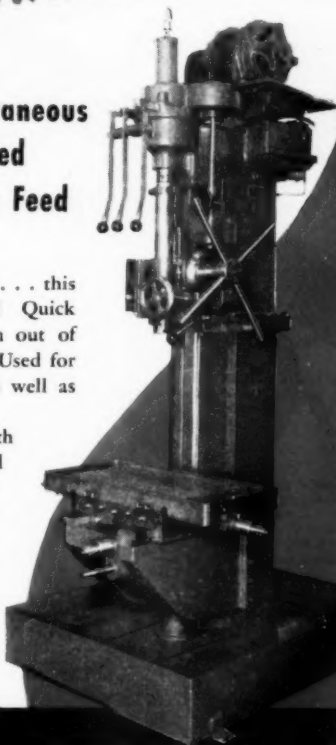
## UNIVERSAL QUICK CHANGE DRILL

... with **12** Instantaneous  
Changes of Speed  
and with Selective Feed

It's *heavy, rigid and versatile* . . . this Baker Drill of the Universal Quick Change type. Assures maximum out of twist drills up to 1½" diameter. Used for heavy duty boring and facing as well as for drilling.

Shown here is Model 150 with standard compound table. Speed and feed changes convenient to operator. Baker-built dependability . . . engineered to do the job better and help *increase productivity*.

Write for more details.



**BAKER BROTHERS, INC., Toledo, Ohio**  
DRILLING, TAPPING, KEYSEATING and CONTOUR GRINDING MACHINES

For better work in less time

... at less cost ... **USE**

**DISSTON**

**BITE-RITE FILES**



Staggered teeth eliminate file tracks ... make finished surfaces smoother. Rounded gullets form curls instead of chips ... thus to a great extent are self-cleaning.

### files that are **DIFFERENT**

Different in design, in performance, in results. And those differences combine to improve workmanship at a saving of time and money. Here are the reasons:

Instead of being cut in straight rows, the teeth of Disston Bite-Rite Files are staggered. This enables you to cut straighter ... when teeth are straight rowed, file tends to follow direction of rows. You can do smoother work ... absence of tracking eliminates much refinishing. You can speed up your filing, for teeth are sharp-biting and hold their edges. And you can count on longer file life ... lower file costs.

There are Disston files for all needs, including a complete line of Disston Swiss Pattern Files ... precision made for precision work.

For other metal-cutting tools of extra quality, ask for DISSTON METAL CUTTING BAND SAWS ... HACK SAW BLADES ... CIRCULAR SAWS ... CARBOLOY FITTED CIRCULAR SAWS ... TOOL BITS.

Write for **FREE** folder, "What File?" showing recommended procedure in selecting proper file.



WHEN YOU BUY A  
DISSTON PRODUCT YOU



**HENRY DISSTON & SONS, INC., 749 Tacony, Philadelphia 35, Pa., U. S. A.**  
In Canada, write 2-20 Fraser Ave., Toronto 1, Ont.

**PRODUCTION**

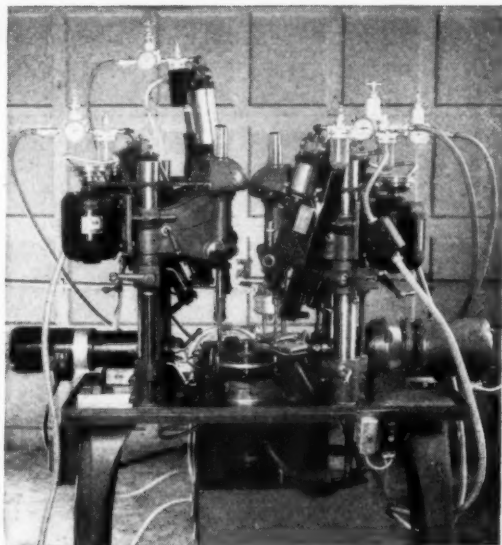
***UP***

**LABOR COSTS**

***DOWN***

**WITH SPECIAL**

***Atlas***  
**ADAPTATION**



Production costs *can* be cut—with engineering ingenuity *and* compact Atlas tools.

A typical example is this automatic machine developed for Bell & Gossett, Morton Grove, Illinois, by the Wales Equipment & Engineering Service, Chicago.

All the operator does is load a part on the dial and step on a floor button. Dial indexes, 4 Atlas heads (operated by Bellows equipment) come down and 2 Govro-Nelson heads come in from the sides to perform these operations:

Position No. 1 — unload a finished casting, load a rough one.

Position No. 2 — drill 31/64" Dia. center hole.

Position No. 3 — drill side hole with Govro-Nelson Model "H" unit.

Position No. 4 — drill 2 No. 31 holes with Atlas head and Ettco 2-spindle multiple drilling head.

Position No. 5 — spot face 1-9/16" diameter with Atlas head.

Position No. 6 — tap side hole 1/4-20 with Govro-Nelson Model "KT" tapping unit.

Position No. 7 — ream center hole 1/2" diameter to remove burrs from side drilling and tapping.

The machine is completely automatic. An emergency button stops it at any point and heads immediately retract.

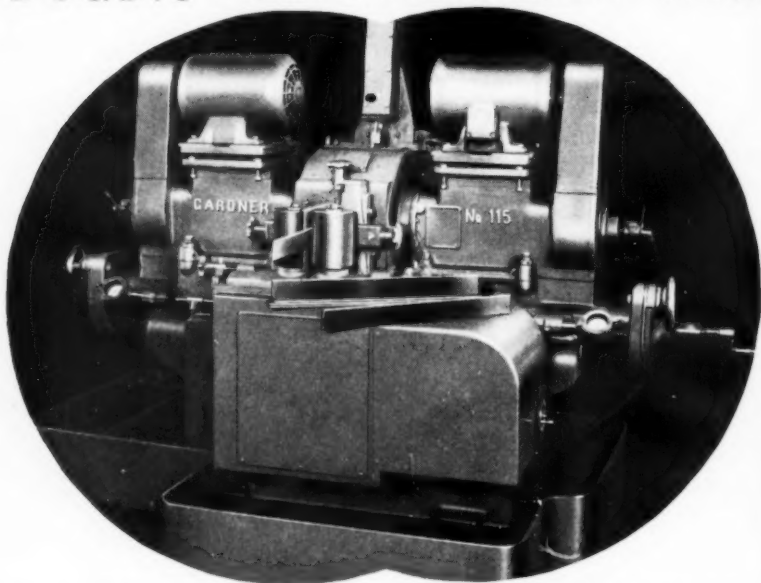
Suggest a way you can increase production and cut costs? Complete information about Atlas drill heads, lathes, millers, shapers sent on request.



**ATLAS PRESS COMPANY**

**750 NO. PITCHER ST., KALAMAZOO, MICHIGAN**

# Double Your Production With



## GARDNER Double GRINDING on dozens of parallel - surface parts!

**B**y grinding TWO parallel surfaces at ONE setting, Gardner DOUBLE Grinders often increase production as much as eight to ten times — over the single-surfacing operation previously used. Ingenious feed-thru or rotary type fixtures make practical the parallel-

### WORK DATA

Part Rubber Straps  
Material Hard Rubber  
Operation Grind Two Parallel Surfaces  
Tolerances  
.001 to .002 for Parallelism;  
.001 to .002 for Uniformity.  
Stock Removal  
.010 Maximum Overall  
Production At 10 to 15 Feet Per Minute  
Feed Hand Feed  
to Rubber Feed Rolls  
Machine  
115" Gardner Double Grinder

surfacing of many hard-to-handle parts and materials, within the closest tolerances.

Let our engineers explain how a GARDNER Double GRINDER will step up the volume of your parallel-surfacing operations, or —

GARDNER - GRIND  
YOUR Flat SURFACES

Write for Our Double GRINDING Bulletin!

## GARDNER MACHINE COMPANY

436 East Gardner Street • • • Beloit, Wisconsin, U.S.A.



## NEW PROVISION FOR **PRECISION** ON MULTIPLE SPINDLE MACHINES

Scully-Jones Micro-Nut used on Adjustable Adapter in Multiple Spindle—Note Mark on Spindle to Facilitate Accurate Adjustment.

Graduated to permit Adjustment to within .001.

Set-Screw Does Not Touch Threads—Prevents Thread Damage.

SCULLY-JONES

### **MICRO-NUTS\***

**You make "Precision" Adjustments**—Now you can make really accurate adjustments on Multiple Spindle Machines to .001 in., by scribing a mark at any point on the Spindle (see illustration) and turning the easy-to-read, calibrated Scully-Jones Micro-Nut in the direction required.

**You Save Set-Up Time**—You simply give a quarter-turn to the set-screw, to lock Scully-Jones Micro-Nuts in place at any location on the thread of the Adapter. Note diagram showing that screw does not touch threads.

**Keep Inventory Down**—Your requirements will be filled immediately from our stock of the following popular sizes, in "Acme" thread: 3/4", 1" and 1-1/16". A complete stock of all sizes for Adapters with "Acme" and "V" threads will be available Sept. 1, 1948. Write for bulletin giving further details and prices.

\*Patent applied for

© 1947

**For Both Types of Threaded Adapters**—You can use these low-cost Micro-Nuts on your present Adapters with or without set-screw slots.

**Make Same Range of Adjustments**—You can make the same range of adjustments, between spindle and work, with Scully-Jones Micro-Nuts as you do with standard solid adapter nuts.

**Nothing to Get Out of Order**—You will like the simple, trouble-free one-piece design, with vapor blast finish. Scully-Jones Micro-Nuts are machined and hardened to our high quality specifications, to assure you the service demanded by modern, high-speed production.

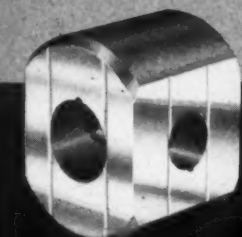
**Scully-Jones**  
AND COMPANY

1907 S. ROCKWELL ST.  
CHICAGO 8, ILLINOIS

**YOU GET LOW COST, FAST, ACCURATE PRODUCTION WITH OUR STANDARD AND SPECIAL TOOLS**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

## CURTIS "LO-FRICTION" UNIVERSAL JOINT Sets New "Standards"



NEW LO-FRICTION  
CENTER BLOCK



Actual photo shows  
NEW CURTIS  
LO-FRICTION Uni-  
versal Joint at top (driving  
end) and a Curtis Standard  
Joint at bottom (driven end) in  
dynamometer test with load and angle  
increased beyond safe limits. NOTE: Stand-  
ard joint shows excessive heating—approach-  
ing failure—while NEW LO-FRICTION joint  
ran cool and handled overload successfully.

**FRICTION** — The Bug-a-boo in offset drives for power transmissions has been greatly reduced, effectively, yet simply, in this NEW CURTIS LO-FRICTION UNIVERSAL JOINT now available.

Note that two (2) grooves on each of the four (4) bearing surfaces of the center block break each surface into four smaller areas making sixteen bearing faces. By reducing the size of frictional areas, wear is more evenly distributed, lubrication is transmitted more effectively, and friction heat, or kinetic energy, is dissipated, thus increasing joint life and efficiency tremendously.

After many tests, all resulting in the same answer, Curtis has made patent application and is now ready to supply this new LO-FRICTION industrial universal joint in sizes from 1 $\frac{1}{4}$ " up, either single or double, or in special joints made to your specifications.

WRITE DEPT. B-1



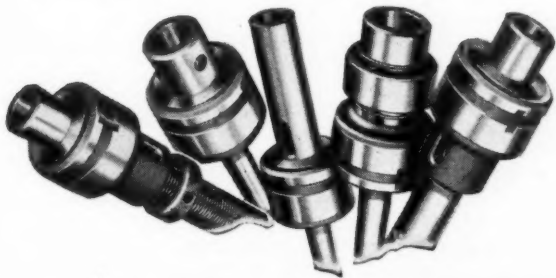
**CURTIS UNIVERSAL JOINT CO. INC.**  
• BIRNIE AVENUE SPRINGFIELD 7, MASSACHUSETTS

# STOP! We've Found a Better Way Out



## with **GLENZER Floating Tool Holders**

There are years of life left in that weary old machine yet, with the use of Glenzer Floating Tool Holders. Actual compensating movements under load achieve positive correction of misalignment on hand and automatic Screw Machines, Garvin Tapping Machines, Adjustable multiple Spindles, Tapping Machines All Types, Drilling Machines, all types.



Any stock size will be sent you for your inspection and test for 30 days, subject to return if unsatisfactory.

THE J. C. **GLENZER** CO., Inc.

6465 EPWORTH BLVD.

DETROIT 10, MICH.

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**AMERICAN  
LASOSAL**

# DRILL JIG BUSHINGS



**QUALITY  
SERVICE**

## IMMEDIATE DELIVERY

Complete stocks maintained at all times by exclusive distributors throughout the U.S. and Canada.

Precision made from finest oil hardened tool steel—ASA Standard—with concentric ground lead to insure perfect alignment.

**FREE DELIVERY ANYWHERE IN THE U.S.A. OR CANADA**

The **STANDARD** of COMPARISON ★ for **QUALITY** and **ACCURACY**

**SEND FOR NEW CATALOG and NAME OF NEAREST DISTRIBUTOR**

*American Drill Bushing*  
**CO., INC.**

1110 So. Santa Fe Avenue, Los Angeles 21, Calif.

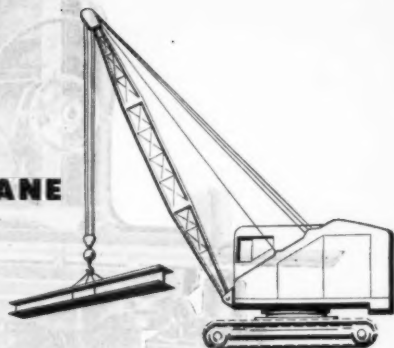
**SPECIALIZING ONLY IN DRILL BUSHINGS**



**A GAUGE**



**A CRANE**



**NO SPINDLE PLAY**



## **AND GRAND RAPIDS' MICRO-ACCURACY**

**G**A precision gauge can be only as accurate as the grinding machine used to finish-grind it. The sub-assemblies of a giant crane present an entirely different grinding problem. Whether in removing a few ten thousandths of metal in a high-accuracy operation, or in removing a lot of metal with greater allowable tolerances, freedom from spindle play is extremely important. That's just one of the reasons why you find Grand Rapids Grinders in so many leading plants of all types — from manufacturers of precision gauges to makers of huge cranes.

Other assurances of long-life accuracy and speed are: the fastest longitudinal table speed (125 f.p.m.) available in any grinder; vibrationless rigidity achieved by massive one-piece column and base casting; patented vertical head adjustment; Bijur one-shot lubricating system.

\*Accuracy within 0.00025 limits.

**To serve you —** Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Tap Grinders, Drill Grinders, and Combination Tap and Drill Grinders.

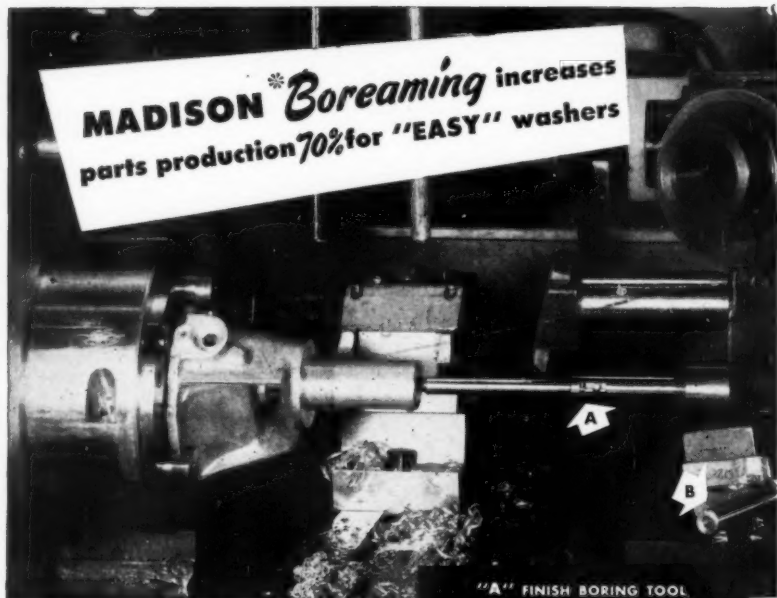


**GRAND RAPIDS GRINDERS**

405 STRAIGHT AVE., S.W., GRAND RAPIDS 4, MICHIGAN

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**MADISON** \*Boreaming increases  
parts production 70% for "EASY" washers

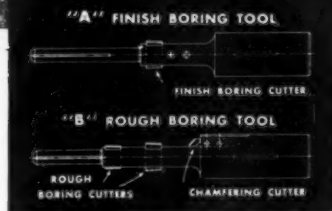


\*Completed boring operation

Here's the story: An aluminum casting required the following operations on inside and outside diameters — Rough bore 1st ID — Rough bore 2nd ID — Finish 1st ID — Chamfer ID — Face Shoulder — Turn 1st OD — Turn 2nd OD — Finish 1st OD — Finish 2nd OD — Thread 2nd OD.

Using single point tools, all six of the turret faces were required to finish a single casting. 19.7 parts per hour were completed.

With Madison Boreaming, EASY WASHING MACHINE CORP. was able to accomplish the same machining on three turret faces, permitting two completed castings per turret



revolution. 33.6 parts per hour were completed.

Thus with two Madison tools Easy gained a production increase of 70.5%. Why not put Madison Boreaming to work for you?

Write for the Madison Catalog today. Get the facts on Madison Boreamers, the tools that make one operation out of boring and super finish reaming.

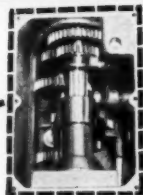
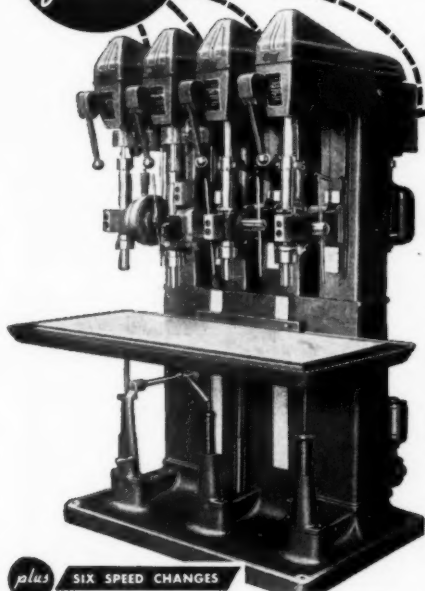


**MADISON**

MANUFACTURING COMPANY  
DEPT. BB-6 MUSKEGON, MICHIGAN

*Avey's*  
**PLUS**  
*features*

add up to **TOP PRODUCTION**



**Selective, sliding gears of AVEY BMA-6 change speeds quickly and easily. Each gear is manufactured and finished by accurate, modern process, shaved, hardened and lapped. Insures smooth operation and long performance.**

**AVEY TYPE BMA-6**

**Four Spindle—12" Overhang**

- 1st spindle—Avey-matic feed
- 2nd spindle—Plain power feed
- 3rd spindle—Hand Feed
- 4th spindle—Tapping (reversing motor)

**plus SIX SPEED CHANGES**

On the AVEY BMA-6 six speed changes are made through selective, sliding gears. This automotive type of gear shift is controlled by a single lever at front of machine. Provides versatility and effective operation.

**plus FINAL SPINDLE DRIVE—V-EE BELTS**

Vee belt used on final drive from gear box to spindle. Increases speed and sensitivity in drilling. Carries full horse power from motor to job.

**plus STANDARD MOTOR — EACH SPINDLE**

Each spindle of AVEY BMA-6 individually motor-driven by standard frame constant speed motor. Fast-mounted motor easily interchanged or replaced. Standard motors can be stocked.

**CAPACITY Cast-Iron**

No. 2BMA6— $7\frac{1}{2}$ " No. 3BMA6— $1\frac{1}{4}$ "

Single to six spindle machines, equipped with hand feed, power feed or reversing motor tapping.



**AVEY DRILLING MACHINE CO.,  
CINCINNATI 1, OHIO**

Gentlemen: Please send without obligation your new Bulletin 647.

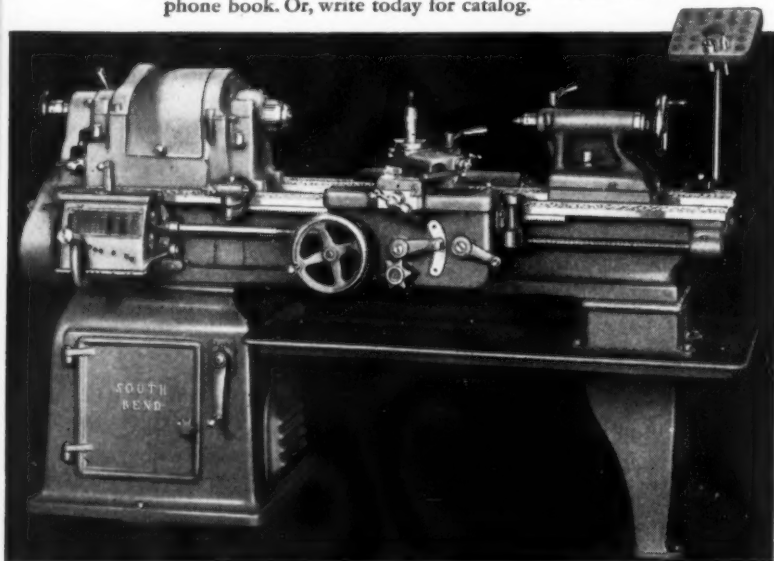
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
NAME \_\_\_\_\_

**CLIP AND MAIL TODAY**

**Avey** DRILLING MACHINES  
CINCINNATI, OHIO

**SOUTH BEND PRECISION LATHES** have solved the production of precision parts for many manufacturers. Their accuracy, speed and adaptability to a wide range of operations contribute to efficient machining. Perhaps you are running some small, precision jobs on slow, heavy machines. If so, find out about South Bend Precision Lathes. These are the kind of jobs for which they are built. Their use can often effect appreciable savings. And, being reasonable in price, they can be installed without excessive capital investment.

Call our local distributor for information. His name is listed under "Machine Tools" or "Lathes" in your classified phone book. Or, write today for catalog.



**16" x 6' TOOLROOM LATHE** with handwheel collet attachment; collet rack; taper attachment; micrometer carriage stop; chip pan; thread dial; 3 phase, 60 cycle, 220 volt motor; and drum switch. Catalog No. 8117-C.

**\$2031.50**

#### PRICES OF SOUTH BEND LATHES

| LATHE SIZE          | QUICK CHANGE<br>GEAR MODEL | TOOLROOM<br>MODEL |
|---------------------|----------------------------|-------------------|
| 16" x 6' Lathe      | \$1640.50                  | \$2031.50         |
| 14½" x 5' Lathe     | 1382.50                    | 1735.50           |
| 13" x 5' Lathe      | 1153.50                    | 1481.50           |
| 10" x 3' Lathe      | 863.60                     | 1151.60           |
| 9" x 3' Bench Lathe | 312.70                     | 481.70            |

Prices include 3 ph., 60 cy., A. C. motor and drum switch — f.o.b. factory



## SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906

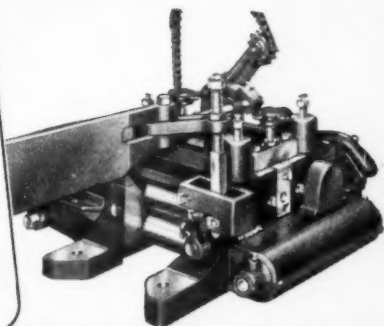
426 EAST MADISON STREET, SOUTH BEND 22, INDIANA

MACHINE and TOOL BLUE BOOK

July, 1948



**Assures Fast  
Safe-Accurate  
Feeding of  
Coiled Strip Stock**



## **WITTEK** *Automatic* **ROLL FEEDS AND REEL STANDS**

### **For All Types of Punch Presses**

Wittek *Automatic* Roll Feeds provide maximum efficiency in the high speed automatic feeding of all types of coiled strip stock to punch presses. Highly flexible in function and application, they are capable of feeding lengths up to 24" per stroke of the press and will handle various stock thicknesses in widths up to the maximum width of the rollers.

Wittek *Adjustable* Reel Stands provide automatically expanding coil holders that center the coil and assure maximum production by eliminating looping, tangling and back lash of stock. If your production problem involves feeding coiled stock to punch presses, consult us. Your inquiry will be given immediate attention. Ask for completely descriptive catalog.

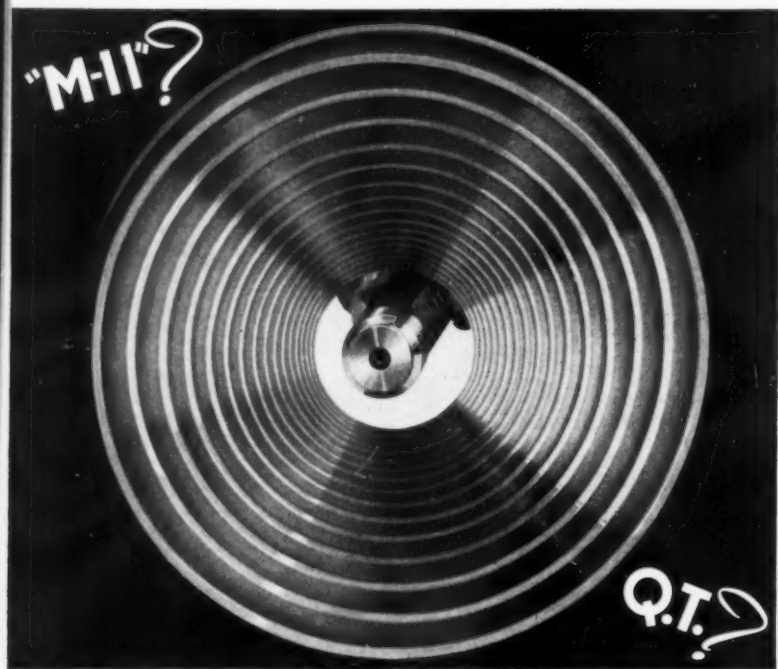


**WITTEK Manufacturing Co.**

4305 W. 24th Place, Chicago 23, Illinois

*Automatic*  
ROLL FEEDS  
and  
REEL STANDS





## Do your threads meet the "Q.T." test?

Standard and special taps, thread milling cutters and plug gages, made of Detroit Tap's exclusive chrome-cobalt high speed steel give you three proven "Q.T." advantages.

Because of M-11's higher red hardness and toughness you can tap or mill faster. That means:

### **Quicker Threading**

Because of M-11's higher resistance to abrasion, you get more threads per sharpening. This means:

### **Quantity Threads**

And because M-11 is more uniform as it comes out of heat-treat you are assured—throughout the life of each threading tool—of the same accuracy originally designed and built into it by Detroit Tap and Tool Company. That means:

### **Quality Threads**

*If you are not using M-11 taps, plug gages or thread milling cutters, you owe it to your threading costs to try them now*

*Carried in stock in standard and many special sizes.*

*The Home of  
"M-11"*

**CHROME-COBALT  
HSS TAPS, THREAD  
MILLING CUTTERS &  
THREAD GAGES**

**DETROIT**  
TAP & TOOL CO.  
8432 BUTLER STREET • DETROIT 11, U. S. A.

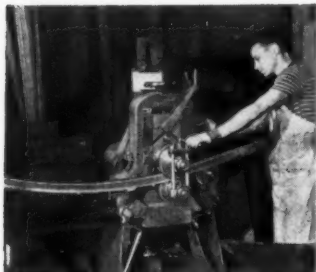
**FOR LOWER MANUFACTURING COSTS**

## BENDING OUTPUT *Skyrockets*

**MACHINE  
TOOLS**

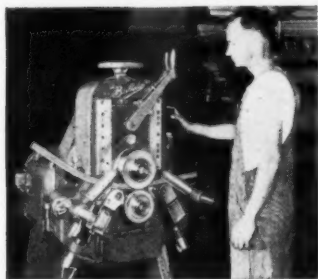
by

*"Buffalo"*



with  
**"BUFFALO"  
BENDING  
ROLLS**

If you bend metal on a production basis, your quickest, cheapest and most accurate way is with a "Buffalo" Bending Roll—a hundreds of shop men have found. It's easy for inexperienced operators to turn out spirals, arcs, segments from angles, tees, rounds, flats, etc., with "Buffalo" Bending Rolls—Sizes and types for every need. Why not let us help you speed up your bending? Simply write:



Above: "Buffalo" Aircraft Type Bending Rolls in operation.

**BUFFALO** **FORGE**  
**COMPANY**

**161 Mortimer Street**

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

**Buffalo, N. Y.**

- ★ BACK SPOT  
FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END  
PUNCHES AND SHEARS
- ★ LOCOMOTIVE  
SHEARS
- ★ MILL TYPE  
SHEARS
- ★ RAPID ACTING  
PUNCHES
- ★ SINGLE END  
SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL  
IRON WORKERS
- ★ UNIVERSAL  
IRON WORKERS
- ★ DRILLS FOR THE  
PRODUCTION LINE —  
DRILLS FOR THE  
TOOL ROOM

**CONTINUOUS SERVICE — FASTER OPERATION — PEAK ACCURACY**

# LW

NEW MODEL

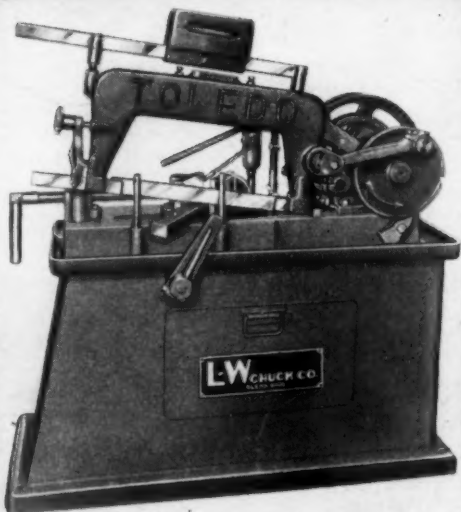
HIGH SPEED

## POWER HACK SAWS

ONLY  
**\$250<sup>15</sup>**

All steel welded base  
and table top  
Belt drive  
Rigid frame  
Gravity feed  
Length gauge  
Expanding clutch  
Swivel Vise

3-speed (90 to 130 r.p.m.)  
V-belt motor drive arrange-  
ment, which assures maxi-  
mum power transmission  
efficiency . . . \$25.90 less  
motor, 1/2 H.P. 1725 r.p.m.  
motor recommended.



● Stops automatically on completion of cut. ● Automatic relief of saw blade on non-cutting stroke. ● 6" x 6" capacity using 10" x 14" blades. ● 12" x 3" clutch pulley. ● Pulley speed 120 r.p.m. ● Coolant pump inside of base. ● Swivel vise permits cutting at various angles. ● Sliding bearing is dovetailed to fit arm and is adjustable in all directions.

Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



REMANUFACTURED



MAGNETIC CHUCK



GRINDING WHEEL



ARTIFICIAL



REMANUFACTURED SWITCH



EXTRA CHUCK



UNIVERSAL CHUCK



POWER HACK SAW



MILLING MACHINE VISE

# L-W CHUCK COMPANY

23 SO. ST. CLAIR ST.  
TOLEDO 4, OHIO



Hundreds of large die shops and industrial plants have found ACRO PULLERS indispensable for the grinding, mounting, and setting of punches. Now there is no struggle to separate the die set. Acro's Indexing Screw Wrenches™ lift the holder axially from the die shoe. The operator raises or lowers the die smoothly, safely, accurately or he may hold it at any desired height. Time saving . . . money making.

Write for details.

\*Patented . . . Exclusively Acro.

**SAVE UP TO 50%  
OF DIE-MAKING TIME!**

Raise punch holders straight up with no pounding, no prying, no damage to the set . . . no lost time.

Write for interesting details.

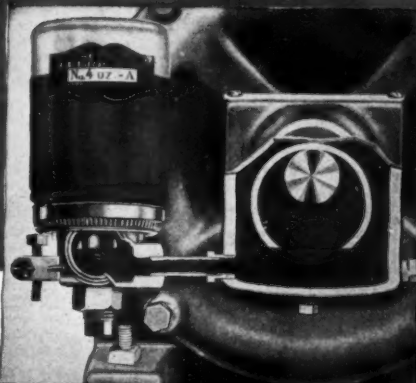
## ACRO LUBRICATORS

### PREVENT BURNED-OUT MOTORS

Authorities say 85% of all lubricating oils never touch the surfaces intended! No wonder repairs on 3 out of 4 machines are due to faulty lubrication. Save your equipment with ACRO LUBRICATORS. They feed oil to motor bearings automatically . . . no drippage, no waste, no overflow. Famous for "Dual Visibility"—sight glass shows exact oil level on bearing . . . reservoir shows oil supply. Eliminates guesswork.

Send for Complete Information.

\*Another exclusive ACRO design.

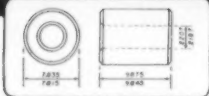
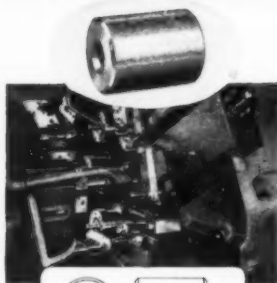


# ACRO

**PROMPT  
DELIVERY**

**METAL STAMPING COMPANY:** 332 E. RESERVOIR AVENUE  
MILWAUKEE 12, WISCONSIN

**EMPHASIS  
ON  
QUALITY**



The above part for an International Diesel Engine Injection Pump is produced on a Greenlee "6". The part, a nozzle valve guide, is completed as shown with a tolerance of .002" on the hole diameter. A later operation grinds the hole to .0005" tolerance. An accelerated reaming attachment is used as shown in the 6th or cutting position for the finishing operation of the center hole. The accelerated action of the attachment permits its use on the Greenlee in four positions, including cut-off.

**WITH GREENLEE  
SIX-SPINDLE  
AUTOMATICS**

A system of quality control and a little teamwork between the inspection and screw machine departments of International Harvester Co., Milwaukee, has elevated production standards and lowered scrap losses in the manufacture of parts for Diesel Engine Injection Pumps.

In the screw machine department pictured above, where four Greenlee 6-Spindle Automatics are at work, the inspector makes an hourly spot-check of parts produced by each machine. It is an important part of a quality control system which aids operators, helps maintain standards, and at the same time allows the foreman more time to handle set-up, tooling, and scheduling problems.

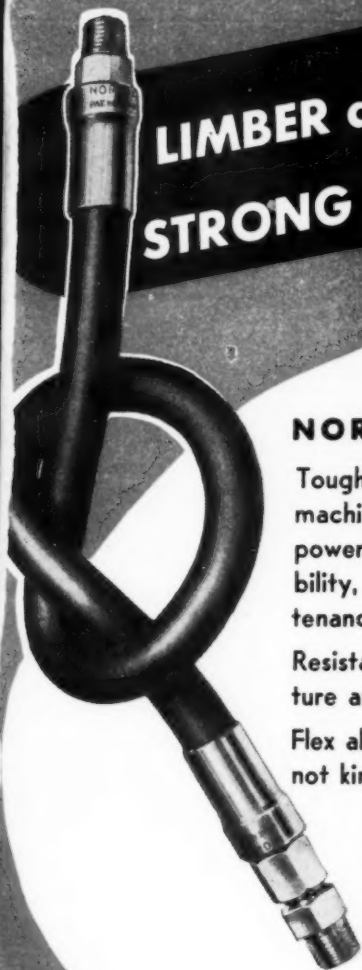
Fitting into this production plan, Greenlee Automatics are called upon to produce parts with a good degree of accuracy and handle both short and long run jobs economically.



**DETROIT OFFICE:**  
 Curtis Bldg., Detroit 2, Mich.

WRITE TODAY FOR NEW LITERATURE describing quick-change features and the new interchangeable lead-screw threading feed for the Greenlee Automatic. Ask also for details on the 16 mm. sound movie describing the building of a Greenlee "G."

MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES



LIMBER as a *Lariat*  
STRONG as **STEEL**

### **NORGREN HOSE ASSEMBLIES**

Tough synthetic, reinforced rubber hose and machined brass couplings team up to make power transmitters unsurpassed for flexibility, pressure tightness and low maintenance.

Resistant to wear and grease; high temperature and extreme vibration.

Flex almost indefinitely without failure. Will not kink on sharp bends.

Permanent or reusable couplings; high or low pressure. Any type hydraulic or pneumatic installation.

Norgren Hose Assemblies can take it . . . try 'em.

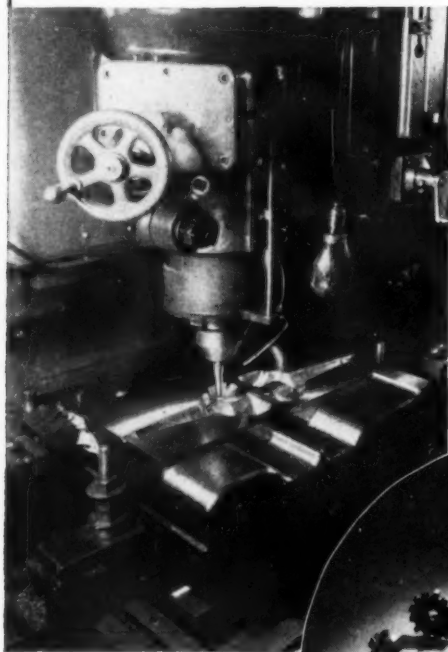
**Write C. A. NORGREN CO.**  
222 Santa Fe Dr., Denver 9, Colo.

*Norgren*

# Raise the Feed!

## CUT COSTS WITH

# T-J CUTTERS



A T-J Cutter at work on a drop hammer die block for steering knuckles. The material is molybdenum die steel of C45-C50 Rockwell.

Do your cutting in tough die steels faster... with less breakage... and more work between grinds! Use T-J Die Sinking Milling Cutters! They're designed for accuracy and sturdiness... made from a standard, extremely high grade steel... properly machined... scientifically heat-treated and accurately ground. Many styles and sizes... proved on countless tough jobs! Send for new catalog. The Tomkins-Johnson Co., Jackson, Mich.



FOR TOUGH JOBS SPECIFY



**TOMKINS-JOHNSON**  
DIE SINKING MILLING CUTTERS



# The Prutton... TAPMASTER



**3**  
TAPPING MACHINES IN

**1**

Speedy: can do three jobs at once, tapping any size hole up to  $\frac{3}{8}$ ". Three separate motors. Single or continuous cycle. Positive feed by husky lead screw prevents tearing of threads. Safe—no jamming of work. Ample tanks for coolant oil—ready accessibility. Descriptive bulletin.  $\frac{3}{4}$ " awning eye-end and  $\frac{3}{4}$ " pipe cap; 1500 per hour on Tapmaster.

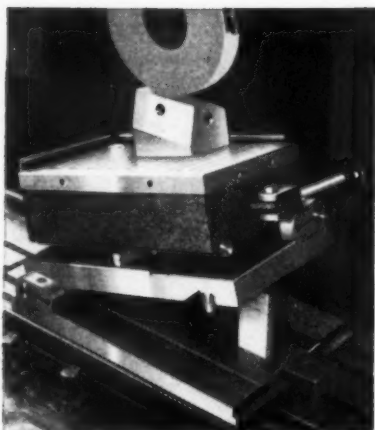
WRITE FOR . . .

. . . DESCRIPTIVE BULLETIN

## D. H. PRUTTON MACHINE & TOOL CO.

5295 W. 130th St.

CLEVELAND 11, OHIO



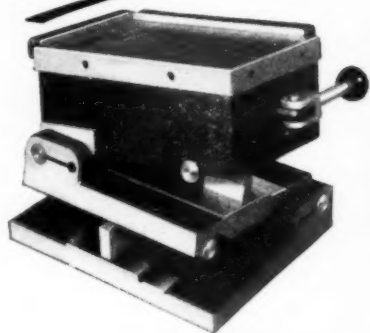
Cords, transformers or other electrical equipment are no longer needed to use the new Magna-Sines . . . Magna-Sines are now available with a permanent-magnet chuck built by Walker.

Thousands of Magna-Sines are in daily use with electric magnet chucks. These units have proved to be the accurate answer for hundreds of precision angular set-ups on grinding, boring, inspection operations, etc. Set up with standard gauge blocks by the sine bar method, the Magna-Sine provides fast set-ups with positive accuracy on both single and compound angles.

With the new permanent-magnet Magna-Sine the amount of magnetic power is controlled by the distance the switch handle is turned . . . thus making these versatile units practical for all types of work pieces.

If you have a magnetic chuck problem, call on Walker engineers to help solve it . . . there is a Walker chuck for every purpose.

*The* **NEW**  
*Permanent Magnet*  
**MAGNA-SINE**  
incorporates a  
*Walker Chuck*



For complete details on the Magna-Sine, write

**ROBBINS ENGINEERING COMPANY**

318 Midland Avenue

DETROIT 3

MICHIGAN

**O. S. WALKER CO. Inc.**

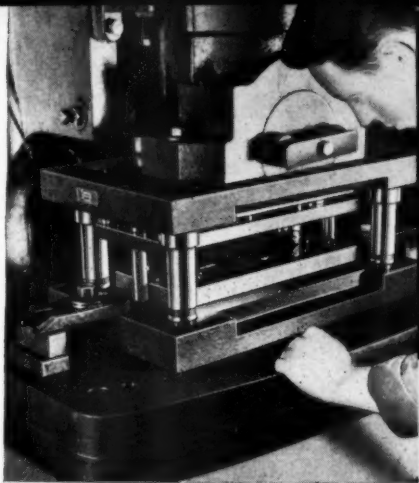
WORCESTER 6, MASSACHUSETTS

*Original Designers and Builders of Magnetic Chucks*

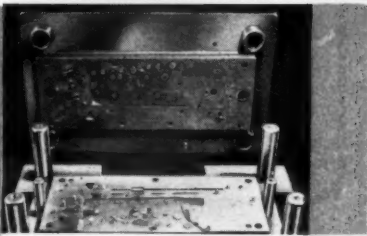
**Precision stampings at  
Felt & Tarrant speed assembly  
of Comptometers**

**tolerances of 0.0005"  
held on 65 holes**

... using **DANLY**  
**PRECISION**



**DIE SET**



**produces 23,000 steel stampings per grind**

Here is a Danly Precision Die Set employed by Felt & Tarrant Mfg. Co. of Chicago to produce frame plates for comptometers—high-speed adding-calculating machines.

The die illustrated is mounted on a four-post Danly Standard Semi-Steel Precision Set. It trims, pierces, and notches 65 holes in .035 cold rolled strip steel. The work-piece is hand fed and positioned on dowel pins. A two-post stripper is used to prevent distortion. Production averages 23,000 pieces between grinds. Typical of other stampings produced for comptometers with Danly Die Sets, tolerance of .0005" on each hole is maintained which speeds assembly line work and permits complete interchangeability of parts.

Here again is evidence of the inherent accuracy of Danly Precision Die Sets under actual press operating conditions. Built to precision tolerances (guide posts and bushings ground to limits of .0002") they permit taking full advantage of the die maker's precision, help you hold close tolerances and get longer tool life.

Danly has a wide range of standard stock sizes available

which can be quickly assembled and delivered to help you save time and money.

**Danly Engineering Service**

Consult our engineering department for helpful recommendations on die sets—large or small, standard or special—for any type of press operation.

**DANLY NATION-WIDE**

★ **ASSEMBLY  
SERVICE**

Danly offices in 10 key cities give immediate attention to your orders. Assembly plants (marked with stars) stock interchangeable parts for quick assembly and delivery of any standard die set to your specifications.

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- \* Cleveland 14, 1550 E. 33rd St.
- \* Dayton 9, 900 E. Monument Ave.
- \* Detroit 16, 1549 Temple Ave.
- \* Grand Rapids, 117 Michigan Ave. N. W.
- \* Long Island City 1, 47-28 37th St.
- \* Los Angeles 54, Ducommun Metals & Supply Co., 4800 S. Alameda
- \* Milwaukee 2, 111 E. Wisconsin Ave.
- \* Philadelphia 44, 18 W. Chitten Ave.
- \* Rochester 4, 16 Commercial St.

get  
this  
free  
bulletin



Illustrates how Danly's Special Machining and Welding Service can save you time and money for unusual die set applications.

**DANLY**

**DANLY MACHINE SPECIALTIES, INC.**  
2100 SOUTH 52ND AVENUE, CHICAGO 30, ILLINOIS



# New Tool Room Mandrel Sets for Use in

**SUNNEN**  
TRADE MARK REG. U.S. PAT. OFF. • MARCA REGISTRADA

*Precision*  
**HONING MACHINES**

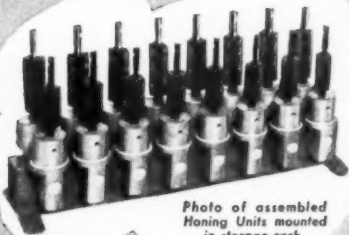


Photo of assembled  
Honing Units mounted  
in storage rack.

- Fast Selection for Any Hole Size
- One Minute Set-up Time to Change Sizes
- Handy Storage of Honing Units
- Full Range of Sizes from  $\frac{1}{8}$ " to  $2\frac{5}{8}$ " Diameter

The steady increase in the use of Sunnen Honing Machines in tool rooms for producing accurate internal diameters, has led to the introduction of these convenient mandrel sets.

Each mandrel set consists of completely assembled Honing Units shipped in storage racks and ready to use in your Honing Machine (see illustration).

Four mandrel sets cover the complete range from  $\frac{1}{8}$ " to  $2\frac{5}{8}$ " in diameter. Sets may be bought at discounts up to 17% from list price of individual items.



Illustrating one complete honing unit

It will pay you to investigate the advantages of these sets. Write for Bulletin XSP-5005—or, on request, a Sunnen engineer will be glad to visit your plant to discuss your honing problems.

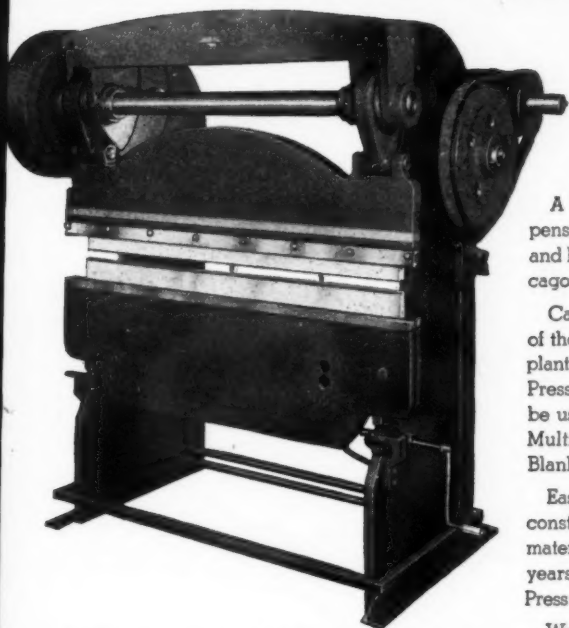
**SUNNEN PRODUCTS CO.** 7985 Manchester Ave., St. Louis 17, Mo.

Canadian Factory: Chatham, Ontario

SP-334

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## STEEL PRESS BRAKE



### TYPE "300"

A POWERFUL, rugged, inexpensive Press Brake, designed and built to the standards of Chicago Steel Forming Presses.

Can handle 40 to 50 percent of the work done in the average plant, thereby releasing the larger Presses for heavier work. Can be used for Forming Embossing-Multiple Punching, Notching, Blanking, etc.

Easy of operation, accurate and constructed of highest quality material and backed by over 45 years experience building Steel Press Brakes and Bending Brakes.

World's largest manufacturer of Steel Hand Bending, Power Bending and Power Press Brakes.

A dependable variable speed drive much desired by all users is standard.

A Small Steel Welded Construction Press Brake a brute for punishment and a prodigious worker for the Sheet Metal Plant—

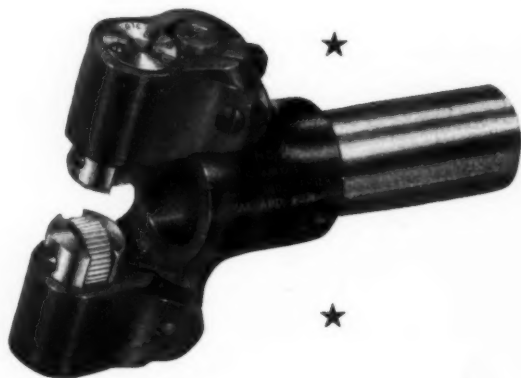
—3 sizes—capacities 10 gage, 4 ft. long; 12 gage, 5 ft. long; 14 gage, 6 ft. long. Powered by 1½ h. p. motor.

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7440 LOOMIS BLVD. . . CHICAGO 36, ILLINOIS

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R  
AND  
L

★  
KNURLING  
TOOL  
★



New streamlined design has half the weight of existing tools of comparable size, affords better grip and control of knurling tools. Lock screw is located on the *outside* of the tool, easily accessible for rapid, accurate adjustment. Screw is longer, and will not work loose. Available in a complete range of sizes to fit all R & L Tools.

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## R AND L TOOLS

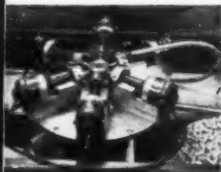
1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.



**Dumore No. 9 Handgrinder**  
 $\frac{1}{4}$  HP; 15,500 rpm.;  $\frac{1}{8}$ " chuck capacity



**Dumore No. 10 Handgrinder**  
 $\frac{1}{10}$  HP; 22,000 rpm.;  $\frac{1}{8}$ " chuck capacity.



**Dumore No. 8 Handgrinder**  
 $\frac{1}{20}$  HP; 18,000 rpm.;  $\frac{1}{8}$ " chuck capacity.



**Dumore Duplex Handgrinder**  
 $\frac{1}{14}$  HP; 17,000 rpm.;  
 $\frac{1}{8}$ ",  $\frac{1}{4}$ ", and  $\frac{3}{32}$ " chuck capacity.



## Wherever you grind or file or burr you can do more with a DUMORE!

Grinding is only the first of many jobs you can do with versatile Dumore Handgrinders. There are dozens of other applications in any shop (a few illustrated above) which are just right for these serviceable tools — polishing, finishing, sanding, burring, scoring, drilling, milling, and many more.

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Send me complete information on the  
Dumore Handgrinder line.

Name.....

Address.....

City..... (.....) State.....

G-10

**Tear out this  
coupon and  
mail today!**

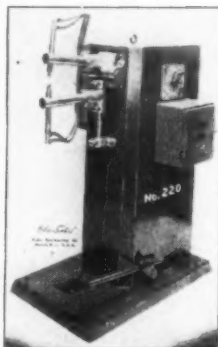
**DUMORE**  
Handgrinders

**If you want a GOOD Handgrinder—Buy a Dumore!**

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WE MANUFACTURE A COMPLETE LINE OF  
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FOR ALL TYPES OF WELDING IN SIZES: 1/4 to 300 KVA.  
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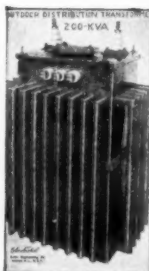


WE MAKE ALL TYPES OF **TRANSFORMERS**  
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Water Cooled, Reactors and Special Trans-  
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Oil Cooled Type



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**EISLER ENGINEERING COMPANY, INC.**  
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*Arc Welders*  
100 TO 400 AMPS.



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*Spot Welders*

FOOT, AIR  
OR MOTOR OPERATED



# Pays for itself in 5 months



When the Rotor Application Engineer called on this manufacturer of materials handling equipment, he found the shop using universal electric grinders for grinding welds. He pointed out the possibilities for cutting costs with Rotor Air Grinders and demonstrated them with these results:

**Cuts grinding time in half** due to greater cutting power . . . higher speed under load.

**Savings pay for tools in 5 months** due to reduced man-hours for grinding. An annual return of 240% on investment.

**Improves working conditions** because Rotor air tools are lighter in weight and run cool even on hot summer days.

Would you like similar benefits? Just call the Rotor Application Engineer.

AIR O'TOOL

AIR

THE ROTOR TOOL CO.  
CLEVELAND, OHIO

HIGH  
CYCLE

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS

# Print...

- SHORT LENGTH TUBING
- WELDING RODS
- SOLDER BARS

# Quickly Economically



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**Pannier**  
"Master Marker"

You get fast, efficient printing of  $\frac{1}{8}$ " to 2" diameter, ferrous and non-ferrous products with Pannier Universal Marking Machine, No. C-1055-A. It prints continuously or intermittently at 72 feet

per minute. It prints in perfect register for marking bar recesses. Motor driven, it has a quick-change printing wheel; belt conveyor; and automatic, interior-feed ink fountain.

Pannier is a specialist in design, engineering and manufacture of all types of marking equipment. Write for recommendations.

#### SEND FOR FULL DATA

Bulletin C-1055-A, giving detailed specifications, is yours on request. Ask for it!

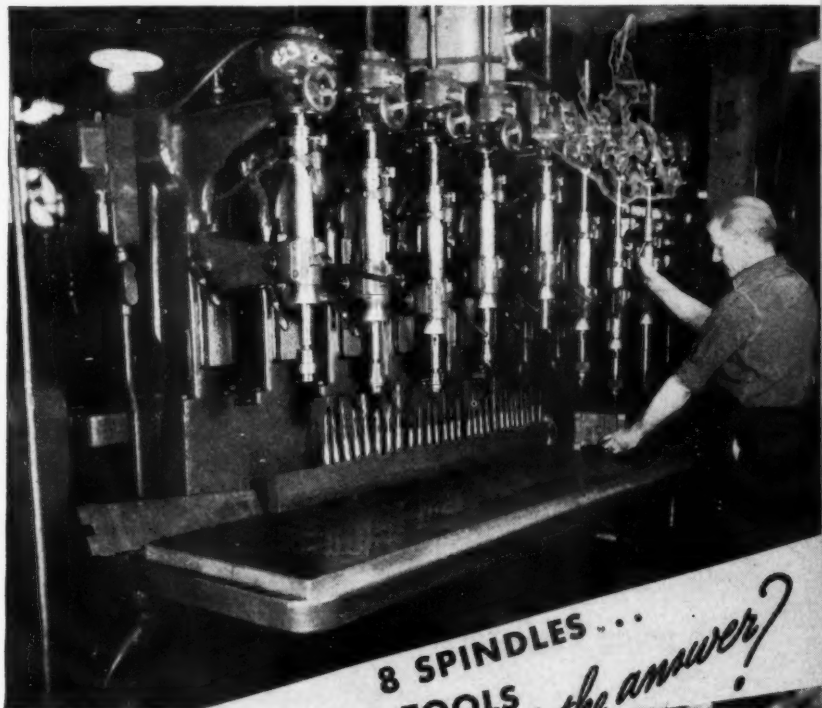
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203 Pannier Building  
Pittsburgh 12, Pa.



8 SPINDLES ...  
32 TOOLS

*What's the answer?*

## MODERN-MAGIC CHUCK AND COLLET EQUIPMENT

The above set-up is a typical example of what can be done with MODERN Magic Quick Change Chuck and Collet equipment. Here, four spindles of the machine, equipped with MODERN Magic Chucks, perform twenty-eight separate operations.

The twenty-eight tools are easily and quickly changed without stopping or even slowing the machine. Bulletin M-101 gives complete details on MODERN Magic Quick Change Chuck and Collet equipment. Send for your copy today.

**PROMPT SHIPMENT . . . . . USUALLY MADE FROM STOCK**

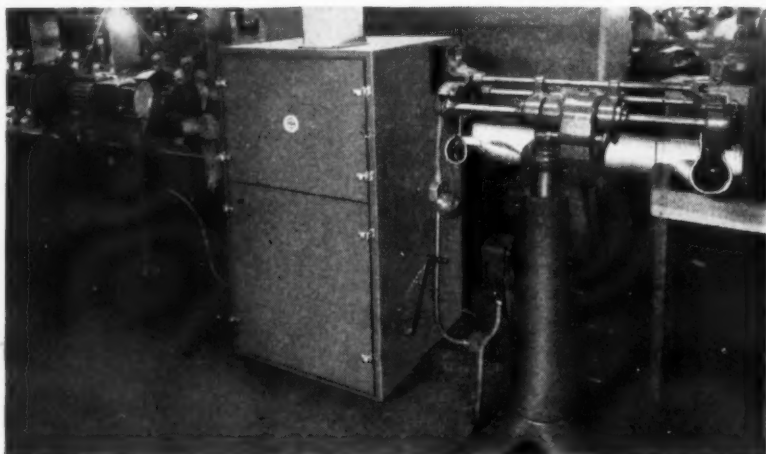
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DIVISION OF

CONSOLIDATED MACHINE TOOL CORPORATION

ROCHESTER 10, NEW YORK

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## are going "hell-for-leather" in this shoe factory

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This is one of many installations showing the adaptability of TORIT Dust Collectors to the dust collection problems of different industries. They are available for immediate delivery in models ranging from  $\frac{1}{3}$  HP to 5HP. For details and the latest TORIT catalog, write:

**TORIT MANUFACTURING CO.**

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**OVER 1000 HARD BLOWS A MINUTE**

*Setting SPEED and LOW COST  
Records on Scores of Jobs*

**METAL FABRICATING**

The Thor Wrench hits **HARD** once on every revolution of its rotor—and with more than 1,000 of these hard impacts a minute is outperforming everything in its class...for *speed* in driving nuts, bolts or cap screws—for *stamina* in standing up longer under impact shock—for *proving the best money saver* on every job! Call a Thor branch today, for a convincing demonstration.

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**PORTABLE POWER**

**TOOLS**

**PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY  
ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS**

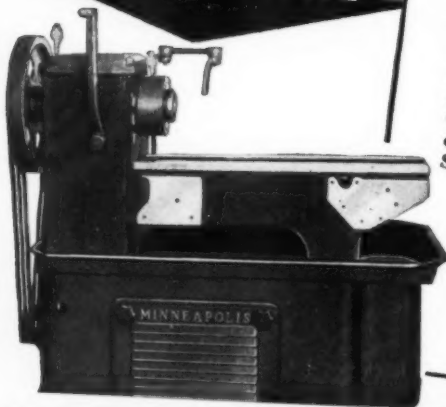
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YOU NEVER USE?

Consider this **ECONOMY** set-up!

*Here's the*  
**BASIC LATHE**



## ADD Your Choice of Drives and Equipment

Singlespeed, four speed, all-electric multi-speed and low speed chain drives.

Manual or air operation of collet, expanding mandril or chuck.

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Six station flat turret and self-indexing stop.

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Special equipment designed for your work.

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You can save money on production lathes—and further hold down your cost by adding only the equipment needed for your particular job! When you buy the MINNEAPOLIS Lathe, you get a high speed, heavy duty model with large spindle capacity—a machine that takes heavy cuts without "chatter" and increases your output. 2 1/4" Spindle capacity, 14" swing, 4 different drives. Let us quote you on a "tailor-made" lathe for your work. Simply send sample part or drawing.

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Machinery Designers and Manufacturers Since 1890

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as easily as mild steel  
with . . .

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by Bridgeport . . .

A revolutionary method of coating standard abrasive grains of a grinding wheel so they cut like so many diamonds, *BuXite* wheels slash carbide grinding and carbide tool dressing costs to 1/5th to 1/20th . . . give you better work faster in *any* grinding operation on *any* metal.

**Try a BuXite wheel in your own shop at no cost**

Put it to work on your own jobs. Keep a record of how it performs. If it doesn't, send it back with the record of how it didn't and we'll forget the bill.



**BUXITE** wheels are exclusive with

***Bridgeport***

**FIRST in Grinding**



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LONG LIFE  
DURABILITY

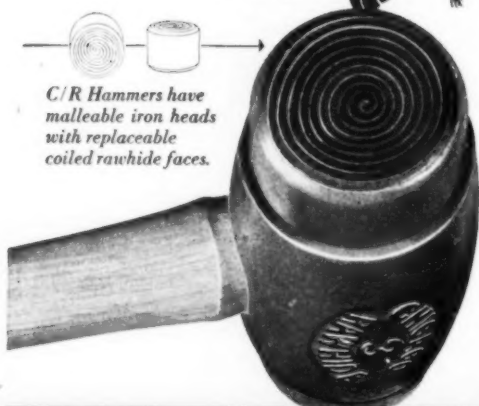


## RAWHIDE

... that's the material which gives you *everything* you want in top grade "soft" hammers and mallets. And *Chicago* means the best in Rawhide. C/R mallets and hammers are made from resilient, tightly coiled rawhide. They absorb shock, deliver powerful blows yet protect delicate machinery and surfaces, and stand up under continuous hard use. They do not split, crumble, or mushroom. For durability, power and safety, always specify *Chicago Rawhide*.



C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.



# CHICAGO Rawhide MFG.CO.

1321 ELSTON AVENUE

CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat and twist belting; belt pins and belt lacings; gears, pinions and gear blanks; aprons and hand leathers; hydraulic packings.



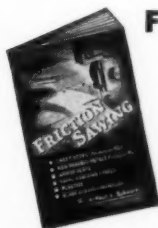
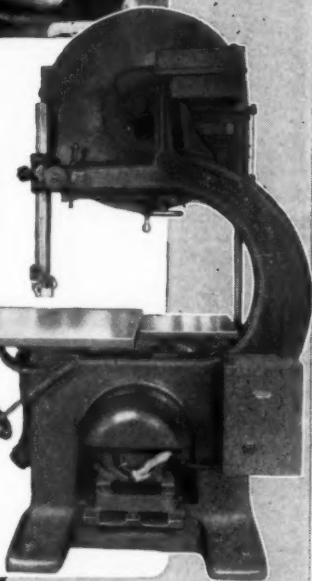
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## **of TRIMMING FORMED PARTS and performing a host of other metal cutting jobs!**

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**HIGH SPEED BAND SAWS**

Write for Your  
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**THE TANNEWITZ WORKS** **GRAND RAPIDS**  
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210-TU



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202

**Speed PRODUCTION WITH . . .**  
**DE-STA-CO Quality TOGGLE CLAMPS**

Your work-holding tools give fast, uniform clamping action—longer life—greater power—because De-Sta-Co's more than forty models give you *quality* features.

- Well-engineered designs, precision-tooled for uniformity.
- Reamed bearing holes for accurate fit, sensitive operation.
- Fool-proof, *positive* toggle action—no cams.
- Friction-relieving off-sets in handles and links.
- Cold drawn solid bars—forged portable clamp parts.

New portable and plunger clamps are coming—to meet your various work-holding needs. Write for illustrated catalog and name of stocking representative in your area.

**DETROIT STAMPING COMPANY**  
 347 MIDLAND AVE.      DETROIT 3, MICH.



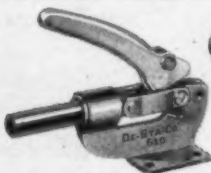
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110-C

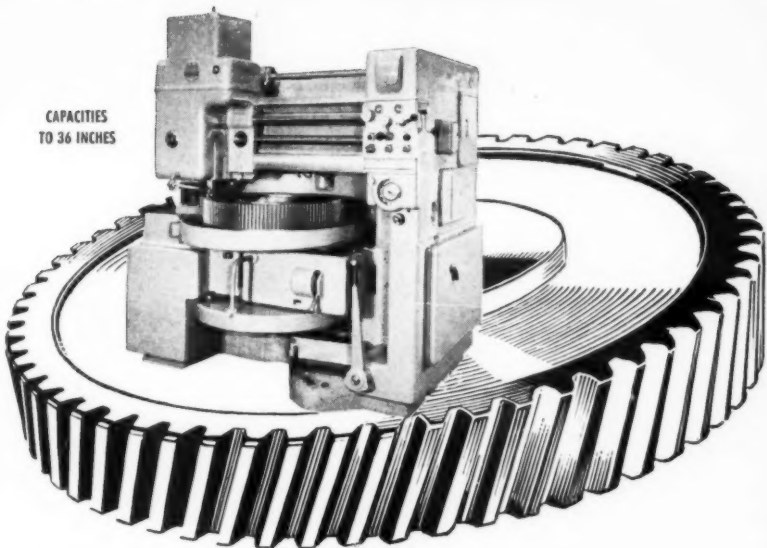


464



610

CAPACITIES  
TO 36 INCHES



IN GEAR CUTTING

# QUALITY COMES FIRST ... then LOW COST

Precision is a tradition with Fellows... that is why you are always certain of high-quality gears when they are generated on the Gear Shaper. Machines, such as the new 36-inch "All-Purpose" Gear Shaper, assure exact duplicating accuracy at the lowest possible cost per piece. Again, your Gear Shaper never asks for "Time off" for it can be used for such a wide variety of work. Bulletins are available on a complete line of Gear Shapers with capacities up to 100 inches.

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The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York 1.

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- fingertip control
- no hand pumping

Now you can get a press that *completely eliminates hand-pumping*. The new Dake Elec-draulic Press provides up to 75 tons from a motor-driven pressure source. And any pressure can be repeated, held, or changed—without stopping the motor.

This press is ideal for production, assembling, and straightening operations, as well as general maintenance work. Pressures are set or released from simple controls at the front of the press. A gauge at eye level speeds operation, and a special safety valve prevents overload.

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For information about this or the smaller presses which make up the complete Dake line, mail the coupon below.



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GRAND HAVEN, MICHIGAN

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**DETAILED REPORT:**

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OPERATION:  
MATERIAL:  
TOOLS:**

14 1/2" South Bend Lathe.  
Boring Fusion Cup for Calorimeter;  
Bore face, bottom and outside rim.  
89% Nickel.  
3/4" Diameter by 8" Long V-R Carbide  
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DEPTH OF CUT:  
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**V-R Carbide  
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225  
.002  
.020  
20

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Carbides**  
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.002  
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2 to 6

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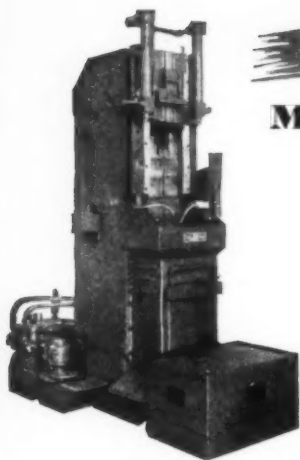
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*to users of  
metal working  
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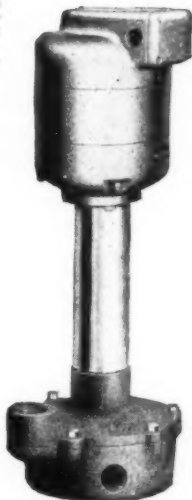
The new features recently installed on all Ruthman Gusher Coolant Pumps increase efficiency, prolong life expectancy, and reduce maintenance cost.

# RUTHMAN GUSHER COOLANT PUMPS

Illustrated is an Oil-gear Type XP Vertical Broaching Machine equipped with a 1/2 HP Model TL-7320 Gusher Coolant Pump.  
Photo Courtesy Oil-gear Co.

New type end-bell on totally enclosed motor has built-in conduit box with ample capacity to accommodate the multiple lead wires or dual voltage stators. Concealed through-bolts fastened from inside of upper end-bell give drip-proof construction and improved appearance. Oversized pre-lubricated ball bearings eliminate oilers or grease fittings.

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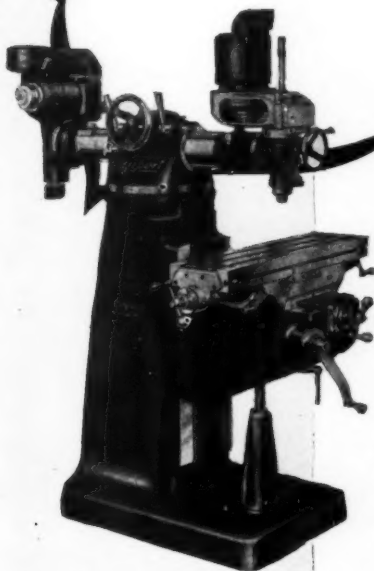
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## *The Bridgeport Milling Machine*

The Bridgeport Turret Milling Machine with High Speed Attachment handles milling, drilling and boring at all angles, with maximum ease and convenience. It is accurate and speedy, sturdy and powerful—a precision machine for production demands.

Shaping operations can be performed at all angles, making this attachment fast and practical on die and mold work of all kinds, as well as for intricate slotting on production jobs.

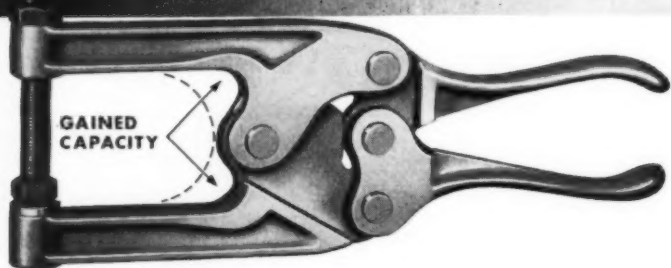
Features include: 15" diameter turret with 5" overarm, rugged construction, table, knee and saddle in convenient front-of-machine position, anti-friction bearings throughout, keyed overarm with worm wheel control for angular settings, large diameter graduated dials.

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**MACHINES INC.**  
**BRIDGEPORT, CONN.**

**GREATER THROAT CAPACITY  
LARGER SPINDLE  
HIGHER APPLIED PRESSURE**



## IN *2 New* KNU-VISE PLIERS

● Square opening utilizes full depth of throat gap. Spindle size increased from  $\frac{5}{16}$ " to  $\frac{3}{8}$ " to give more stiffness and surer grip. Spindles now also available in copper to prevent adhesion of weld spatter. Improved handle design for greater comfort. Model P-1200 provides 1200 pounds clamping pressure, with throat capacity  $1\frac{1}{32}$ " x  $2\frac{1}{4}$ ". Model P-1800 provides 1800 pounds clamping pressure, with throat capacity  $1\frac{1}{32}$ " x  $1\frac{1}{4}$ ".

All Knu-Vise clamps are characterized by the toggle-action locking grip which can be applied and released instantly with normal hand pressure. There is a Knu-Vise Clamp to meet every clamping requirement.

Send for catalog describing these welding, drilling and riveting aids that bring economy and increased efficiency to your production.

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PRODUCTS**

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# deep slotting in magnesium

with  
**BARBER  
COLMAN**  
*Job-Engineered*  
**CUTTERS**

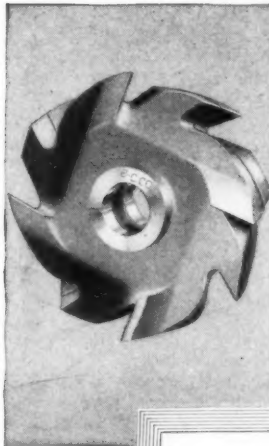
Deep slotting cuts in soft materials, when using conventional cutters, often result in chip congestion in the cutter, causing poor finish, and possible cutter breakage. Barber-Colman cutter engineers have designed a new style slotting cutter to take care of just such conditions.

On the job illustrated here . . . a typical example of this kind of milling . . . slots, 1.138" wide x 1" deep x 2" long, are rapidly milled from solid metal in magnesium brackets. Cutting time averages two pieces per minute. A patented Barber-Colman improved design interlocking side milling cutter which has coarse staggered teeth arranged with continuous cutting edges, is used to provide a free flow of chips.

When production calls for high speed milling of light metals, call on Barber-Colman Engineers for long-lived, efficient cutters, specially engineered for the job.

## Barber-Colman Company

GENERAL OFFICES AND PLANT 119 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



### JOB FACTS

Material — Cast Magnesium, Soft  
Operation — Mill slot, 1.138" wide x  
1" deep x 2" long  
Cutter — Patented B-C Interlocking Staggered Tooth Side Mill, 6" x 1-3/16" x  
1-1/4"  
Feed — .24" per minute  
Cutter Speed — 750 S.F.M., 480 R.P.M.  
Floor-to-Floor Time — 1/2 minute  
Tool Life — 300 pieces per sharpening



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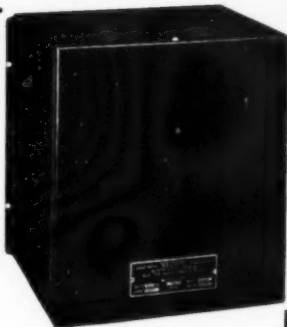
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Magnetic  
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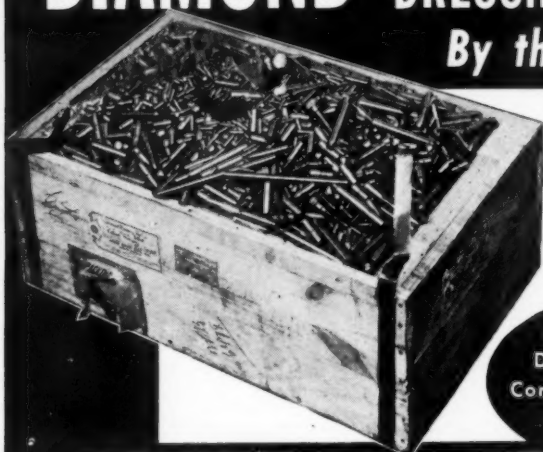
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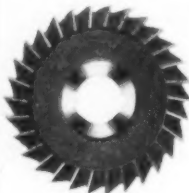
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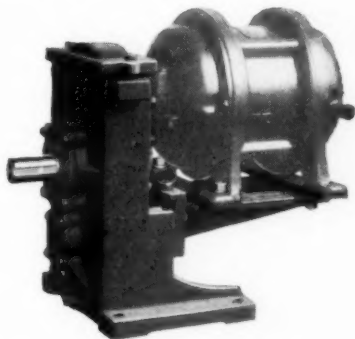
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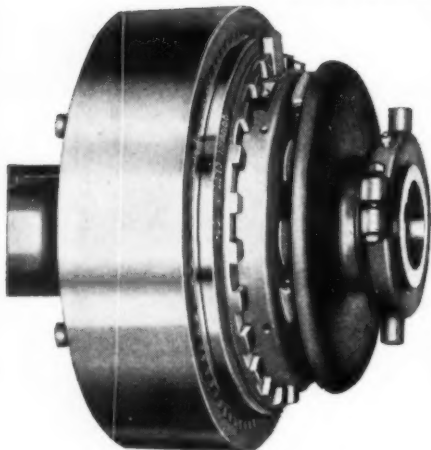
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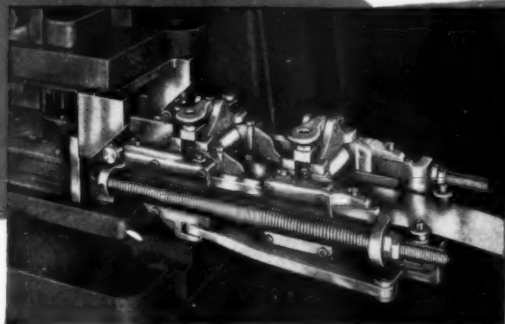
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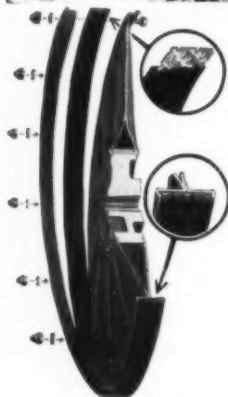
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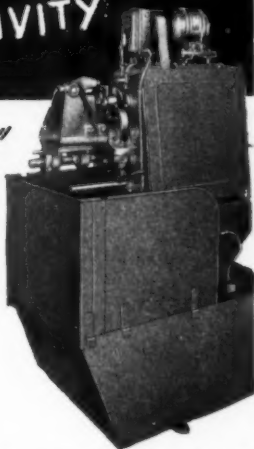
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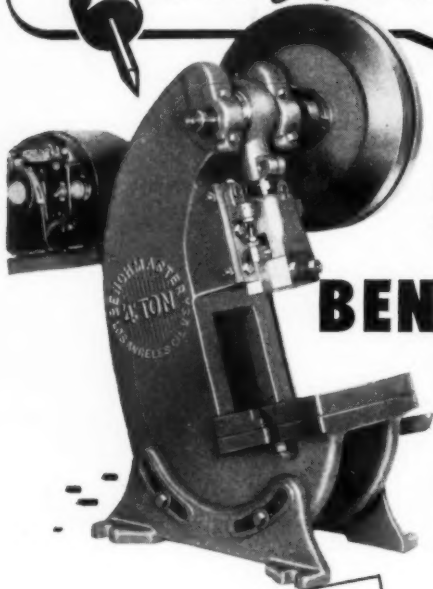
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### TAPPERS

Portable

### VALVE SEAT GRINDERS

### VALVE REFINISHING SHOPS



**P**RECISION design . . . tested materials . . . engineered construction . . . flexibility . . . adaptability . . . unexcelled performance . . . every tool is electrically and mechanically correct before leaving the plant.

## UTILITY FLOOR GRINDER

### Model 500

12", 14" and 18" wheels  
WHEEL GUARD  
ADJUSTABLE TO  
WHEEL WEAR

Totally enclosed motor;  
push button starter for  
overload protection;  
ballbearings enclosed  
in dust-tight housings;  
enclosed adjustable  
wheel guards.

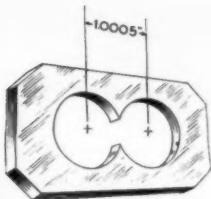


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OR WRITE DIRECT**

**The UNITED STATES ELECTRICAL TOOL Co.**  
CINCINNATI, OHIO



Put jobs like this...



Two intersecting punched holes are reamed to size and location within .0005". The stainless steel work piece is held in a table fixture and fed into the cutter by transverse lever feed.  $\frac{1}{16}$ " of stock is removed on the diameters. Production is 700 pieces per nine-hour shift on a Nichols Production Model Miller.

on "the miller that uses its head"

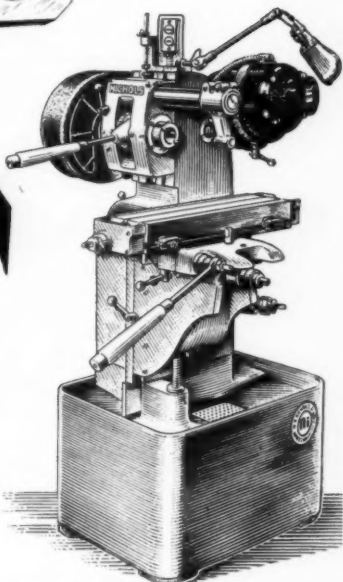
Because the Nichols Miller is endowed with an unusual versatility, by virtue of its unique rise-and-fall spindle, it is often a "jack of all trades" in a shop. In addition to conventional milling, it is used for such varied jobs as profiling, drilling, reaming, turning, boring, facing, key seating, broaching and vertical milling. Yet this same machine is designed so functionally and built so accurately that it is used for high production of precision parts with tolerances to "tenths."

Nichols Millers are made in the following models, all having the same basic features but modified especially for particular requirements: The Standard Model for general shop use; the Tool Room Model with special table and extra large micrometer dials for finer measuring control; the Semi-Automatic Model equipped with automatic pneumatic table feed; the Production Model with lever longitudinal and transverse feeds; and three Double Spindle Models for use where the simultaneous action of two cutters is practical.

MANUFACTURED BY W. H. NICHOLS COMPANY  
WALTHAM, MASSACHUSETTS

#### CONDENSED SPECIFICATIONS

|  |                                |
|--|--------------------------------|
| Table Working Surface                    | 6 $\frac{3}{4}$ " x 21" or 30" |
| Longitudinal Travel (screw or lever)     | 10" or 19"                     |
| Transverse Travel (screw or lever)       | 7"                             |
| Vertical Travel — Knee                   | 13 $\frac{1}{2}$ "             |
| Rise and Fall of Spindle                 | 4 $\frac{1}{2}$ "              |
| Selective Speed Ranges up to 5000 R.P.M. |                                |
| Weight                                   | 1250 lbs.                      |



THE  
*Nichols*  
MILLER



Write today for new Nichols Miller Catalog which describes in detail all five models of "The Miller that uses its Head."

NATIONAL DISTRIBUTORS NICHOLS-MORRIS CORP., 50-G CHURCH ST., NEW YORK 7, N. Y.

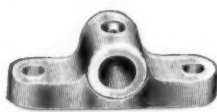
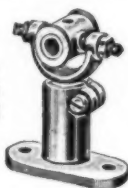
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The castings displayed on this page are just a part of our Stock Line. You save time and money when you use Chicago Castings.

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Chicago DIE CASTING MFG. COMPANY  
2512 West Monroe Street, Chicago 12, Illinois



# STEP UP YOUR PRODUCTION WITH GENESEE

## INSERTED BLADE FACING and COUNTERBORING TOOLS

Production goes up and cost goes down when you use Genesee Facing and Counterboring tools. These features will convince you.

- Chip space is 100% efficient no matter how often blades are reground.
- Two styles with straight or Morse taper shanks carried in stock.
- Standard sizes from 1/4 to 4 diameter.
- Furnished with high speed steel, cast-alloy or Tungsten Carbide tipped blades.
- Interchangeable pilots.
- Blades may be reset to exact diameter after regrounding.
- All tools have heat treated alloy steel bodies with ground thread for extreme accuracy.



Facing and  
Counterboring  
Tool



Another production increaser  
**GENESEE ADJUSTABLE  
HOLLOW MILLS**



➡ Let our Engineering Department solve your Production Tool Problems.

Write for Catalog 45H

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COUNTERBORING TOOLS • SPECIAL PRODUCTION TOOLS

# Monarch

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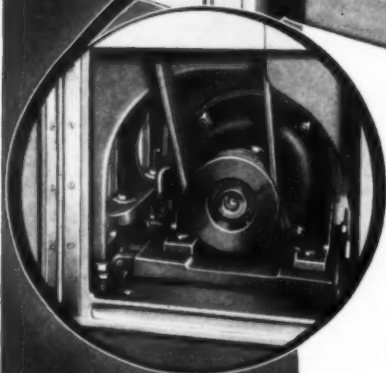
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THE MONARCH MACHINE TOOL CO.  
SIDNEY, OHIO



# LIMA

## ... THE FINEST IN DEPENDABLE POWER!

Sturdy construction, economical and trouble-free operation, is of prime importance to every Original Equipment Manufacturer in selecting electric motors to become integral parts of their products. LIMA motors offer all of the requirements for O.E.M. applications—why not discuss your problems with us. There is no charge for consultant services.



Lima Type RS Drip-Proof  
Induction Motors Available  
in sizes 1/2 to 75 h. p.

### THE LIMA ELECTRIC MOTOR CO.

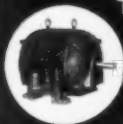
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LIMA, OHIO

REPRESENTATION IN MOST PRINCIPAL CITIES

LIMA GEARSHIFT DRIVES

LIMA PEDESTAL GRINDERS - LIMA ELECTRIC MOTORS



# PROSSER CARBIDE GRINDERS

*... pay for themselves — fast ...*

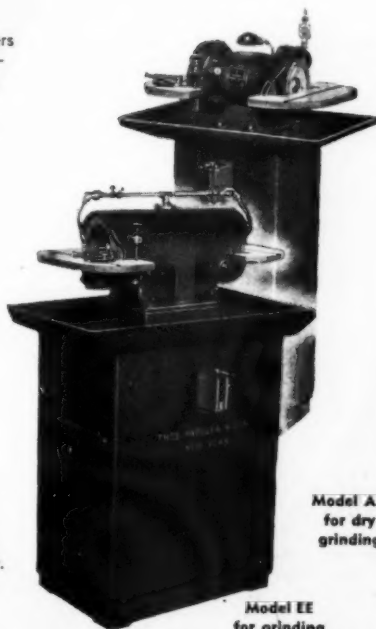
**in TOOLS  
SAVED!**

Shop experience proves it: Prosser Grinders reduce waste and breakage of costly cemented carbide tools — and help them deliver more cuts between grinds. Also equally effective for stellite and high speed steel.

**QUICK SETTING.** The famous Prosser index device speeds setting of table to desired angle. Table need never be raised or lowered — and once set, it stays put.

**MORE WORK PER WHEEL.** Easy compensation for wheel wear. Wheel face can be kept close to edge of table . . . wheels can be used up practically 100%. Fewer wheel changes, more time and money saved. Prosser Carbide Grinders are made in bench and floor models, for rough grinding and fine finishing, wet or dry. Chip-breaker and drill-grinding attachments.

Write for literature on money-saving Prosser Grinders — designed by the same Prosser engineers who introduced cemented carbide to American industry.



**Model AA  
for dry  
grinding**

**Model EE  
for grinding  
dry or wet**

**Dealerships available**

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**1845**

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# They're all using **SHEAR SPEEDS\***

\*TRADE  
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## **AUTOMOTIVE**

Matches output of 8 double thread hobs plus less shaving time.

## **MISCELLANEOUS GEARS**

One Shear-Speed\* produces all these stoker drive parts.

## *and now for* **BIG GEARS**

The new Shear-Speed\* 18103, for gears, clutches, and other external shapes up to 10 inch O. D. and 2 3/4 in. thick.

*If you have not yet investigated how the Shear-Speed\* can cut your output of gears, clutches and other external shapes, write today for Bulletin #1800-47.*



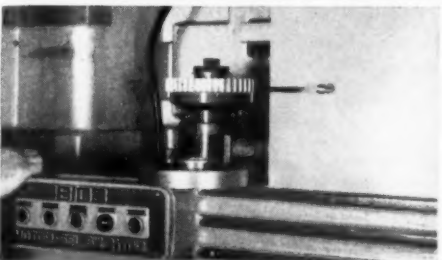
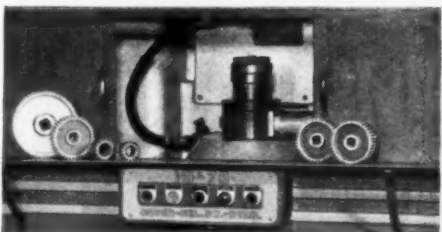
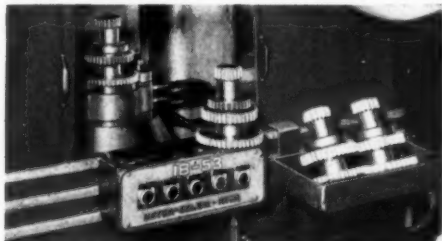
## **WRINGERS**

Better gear design.  
Cutting time 30 secs.



## **BICYCLE CLUTCHES**

Eccentric shapes.  
Cutting time 14 secs.



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# *Special* **CARBIDE TOOL GRINDER**

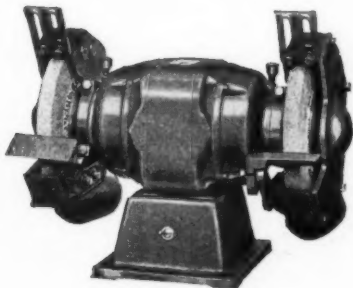


## **FOR QUICKLY AND ACCURATELY SHARPENING CARBIDE TOOLS**

BALDOR GRINDER, series 500, (shown above) is the newest development in grinders designed and fully equipped for sharpening Carbide Tools quickly and accurately; has sturdy  $\frac{1}{2}$  H.P., reversible, ball-bearing motor. 6" Silicon Carbide wheels; adjustable tool-rest tables, water pot. Complete as illustrated and GUARANTEED 2 YEARS against burn-out.

**Reasonably Prompt Shipment**

**ASK FOR BALDOR BULLETIN 321C ON COMPLETE LINE**

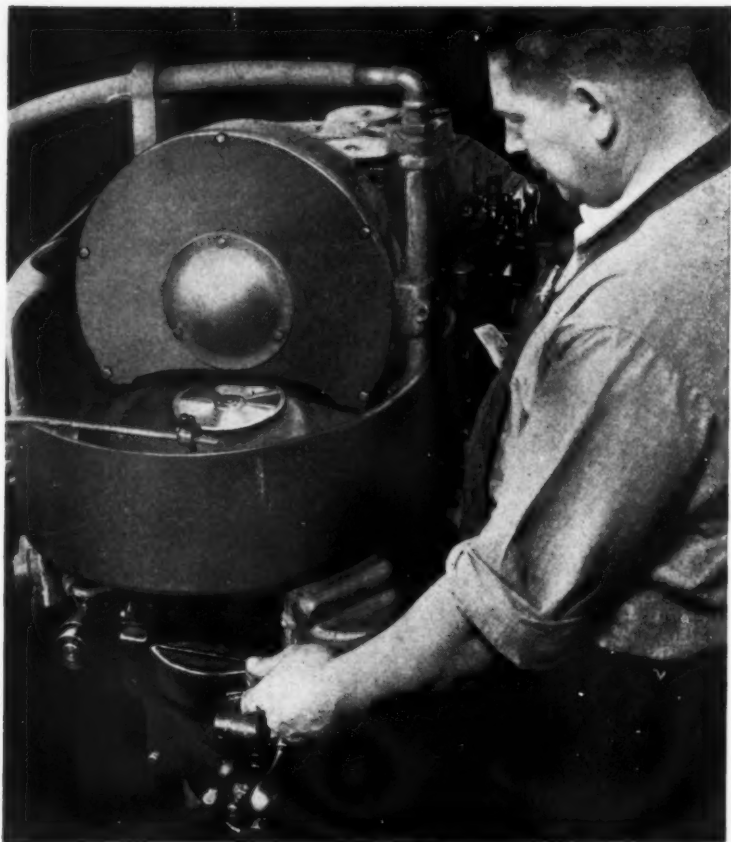


AT LEFT: BALDOR Bench Grinder, No. 101.  $1\frac{1}{2}$  H.P., ball-bearing motor; 1725 rpm; 10" Aloxite wheels; adjustable tool rests.

**BALDOR ELECTRIC COMPANY**  
4368 Duncan Ave., ST. LOUIS 10, MO.

District Offices in Principal Cities

**BALDOR**  
BALL BEARING **GRINDERS**



## **EXACT PARALLELISM**

### **ARTER Rotary Surface Grinders**

are built in several models having capacities from 8" to 40".

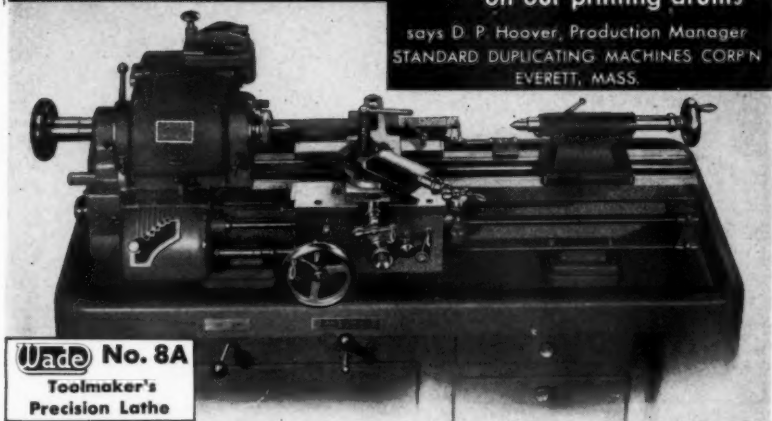
**ARTER GRINDING MACHINE CO.**

**WORCESTER, MASSACHUSETTS • U. S. A.**

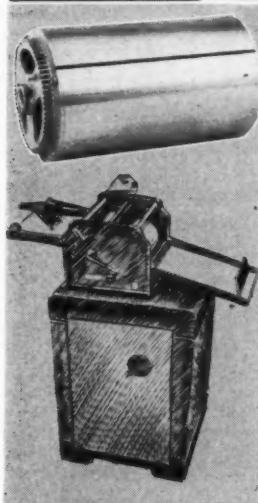


"Because it gives us  
smooth finish and dimensional accuracy  
on our printing drums"

says D. P. Hoover, Production Manager  
STANDARD DUPLICATING MACHINES CORP.  
EVERETT, MASS.



**Wade No. 8A**  
Toolmaker's  
Precision Lathe



We had asked Mr. Hoover to tell us *just why* he preferred the Wade No. 8A Toolmaker's Precision Lathe for the finish operation on this drum. (He uses a less expensive, less accurate lathe of another make for roughing.) He told us that the 8A lathe has the **speed** and **ruggedness** he needs for high production output and a smooth surface, using tungsten carbide tools; and it has the **precision** that he demands for his final O.D., held to a tolerance of  $\pm .002"$ , and made possible through the rigidity of the spindle and the power of the drive.

One of the secrets of good printing reproduction on this low-priced fluid duplicator known as Model SWA is the great care used in casting and machining the zinc printing drum. This very efficient Standard Duplicator would fall far short of perfection with a poor drum, and we are proud that our No. 8A lathe is helping to maintain quality and speed up production at the Standard plant.

#### SPECIFICATIONS

|                            |                                     |
|----------------------------|-------------------------------------|
| Swing over Bed             | 8 $\frac{1}{2}"$                    |
| Distance between Centers   | 24"                                 |
| Collet Capacity            | 1"                                  |
| Taper Standard for Centers | No. 2 Morse                         |
| Tailstock Spindle Travel   | 3 $\frac{1}{2}"$                    |
| Tool Shank Section         | 3 $\frac{1}{2}"$ x 3 $\frac{1}{2}"$ |

Write today for illustrated folder describing this very desirable  
Toolmaker's Lathe and its accessories

THE WADE TOOL CO., 51 RIVER ST., WALTHAM 54, MASS.

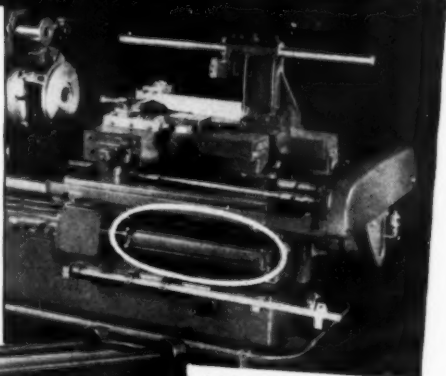
This is another example of how you can  
**WADE** into your work with a **Wade**

# HANNIFIN

*Right for the Job!*

WHEN it's a Hannifin cylinder, it's right for the job! It's right because it is specially designed and built to meet the user's specifications. Yet in most instances, it is a standard Hannifin cylinder right out of the big Hannifin line. This is easy because the Hannifin line is COMPLETE! For users of cylinders, this means lower engineering costs... quicker delivery... complete interchangeability of parts... better design... superior performance.

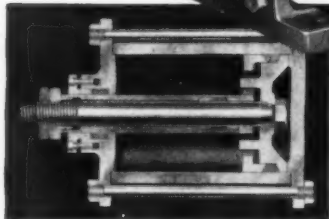
It pays to specify HANNIFIN!



ABOVE—Hannifin Pneumatic Cylinder makes traversing of carriage easy and fast on this Gisholt "Simplimatic" lathe.



## PNEUMATIC *Standardized* CYLINDERS



This cross-section view shows Hannifin's exclusive "Leakproof" design used in Series "R" Cylinders.

**SMOOTH, FULL POWER PERFORMANCE.** All Cylinders "TRU-BORED" from steel and honed to satin finish. Rods ground and polished.

**SUPERIOR DESIGN.** Hannifin's exclusive external adjustment featured in Series "R" Cylinders. Permits tightening piston packing without removing end caps or disturbing internal parts. Double cup piston featured in Series "LW" cylinders. External cushion adjustment provided for all cushioned models.

**RUGGED CONSTRUCTION.** Built to withstand hardest kind of service. Note heavy steel cylinder wall section; provides broad seat for gasket, resists accidental blows.

**COMPLETE LINE.** A wide choice of styles. Sizes 1" to 12", or larger. Any length stroke you specify. Single or double end rods. Cushion for head end, rod end or both. Ask for recommendations and Bulletin No. 11

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AIR CYLINDERS • HYDRAULIC CYLINDERS • HYDRAULIC PRESSES  
PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES

# PROFITABLE PRECISION PRODUCTION WITH ACME-GRIDLEY AUTOMATICS



## JOB FACTS

**Bushing Valve Guide—Cast Iron—**Concentricity of hole ( $2\frac{1}{4}$ " long) and O. D. held within .002". Machine time, 4.1 seconds, or 878 pieces per hour—on Acme-Gridley 1" RA-6 Spindle Bar Automatic.

**How the Job is Handled—**Cast-iron parts come to the machine already rough centerless-ground. They are magazine fed through the rear of the spindle by mechanical means, and chucked on the large diameter against a stop. All six end working tool positions are utilized for tools. Air is injected through the 4th and 5th position collets, which, together with a heavy flow of light cutting oil, eliminate chip dust—insuring concentric chucking, essential to the .002" limits.



Why you'll get MORE GOOD PIECES IN THE PAN with Acme-Gridley Automatics

1. The design is stable—proved in use on more than 40,000 Acme-Gridley Multiple Spindle Automatics.
2. Rigidity and precision construction are combined in a finished machine that stands up—for exceptionally fine-tolerance work at high speeds.
3. The design is adaptable—wide tooling zone with provisions for independent auxiliary drives places no limits on the ingenuity of tooling employed.
4. Quick change (positive) camming for both short and long run jobs insures sustained accuracy at high production rates—more good pieces in the pan.

*May we show you how Acme-Gridley Automatics can increase profits and precision on your production?*

## The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics:  
1-4-6 and 8 Spindle • Hydraulic Thread  
Rolling Machines • Automatic Threading Dies  
and Taps • The Chronolog-Limit Motor Starter  
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# Increase Production Range with the **NEW** INDEX MILLING MACHINE

VERTICAL • HORIZONTAL • ANGLE MILLING  
BORING • DRILLING

The new Index Angle-Milling Head accurately handles horizontal milling operations of every type including boring and drilling. Change over from vertical to angle milling takes only a few seconds and is done without disturbing the work on the machine table. The attachment can also be used as a cutting arbor or tool holder.



- Automatic Spindle and Table Feed.
- Table Size - 8 x 34".
- Twelve variable cutter speeds up to 2450 rpm.
- Three table speeds can be varied indefinitely.

The Model 50 Index Milling Machine offers a greatly increased range of working capacity over any machine of comparable size or cost, plus a substantial saving on production time and labor. The sound engineering and solid construction of the machine make an extremely rigid unit without deflection or chatter to throw off the accuracy of the work.

A quick change full-gear table feed mechanism delivers power to the table through a splined feed shaft. The Key Way of the Lead Screw is eliminated, further adding to the machine's great precision and sensitive operation. Hand finishing of work is reduced to a minimum.

Other features of the Index Milling Machine include precision ground Lead Screws, large, easy-to-read Angle Dial, Automatic Controls throughout and a full line of accessories.

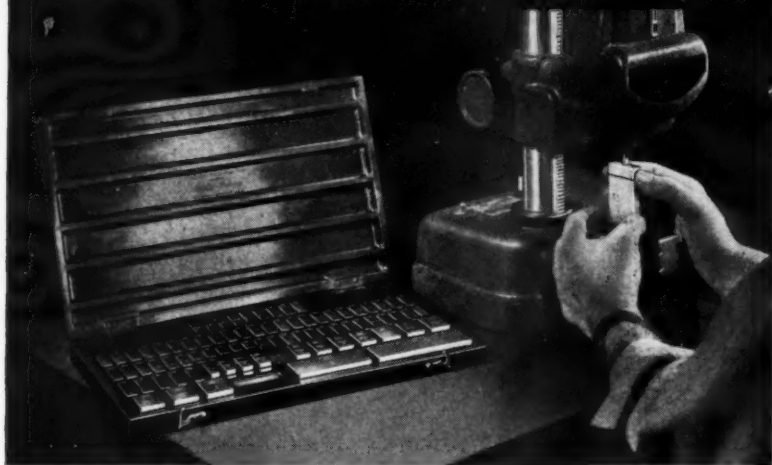
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# INDEX MACHINE Co.

545 N. MECHANIC STREET

JACKSON, MICHIGAN

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Close-limit machine work calls for inspection standards regularly checked and re-established wherever necessary. Equipment for this kind of gage-testing is not costly. A set of 81 Johansson Gage Blocks as pictured, providing more than 120,000 different combinations, in steps of .0001", from .200" to more than 12 inches, costs less than 4 mills (4 tenths of a cent) per measurement, in Inspection Standard "A" Jo-Blocks . . . the biggest bargain in accuracy-assurance you could buy. Jo-Blocks come in accuracies of  $\pm .000002"$ ,

.000004" and .000008". They will put your shop on a basis of enduring accuracy.

## FORD MOTOR COMPANY

### JOHANSSON DIVISION

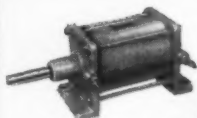
3606 Schaefer Road  
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Every shop that works to thousandths or closer—whether on production, adjustments or repairs, needs—

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for **FASTER, CHEAPER  
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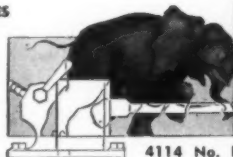


PNEUMATIC  
WORK FEEDERS

Illustrates, describes Air Cylinders, Valves, air operated Presses, Vises, Chucks, Hammers, Drill Feeds, Drill Press Feeds, Work Feeders, Timers, semi-automatic combinations, etc.



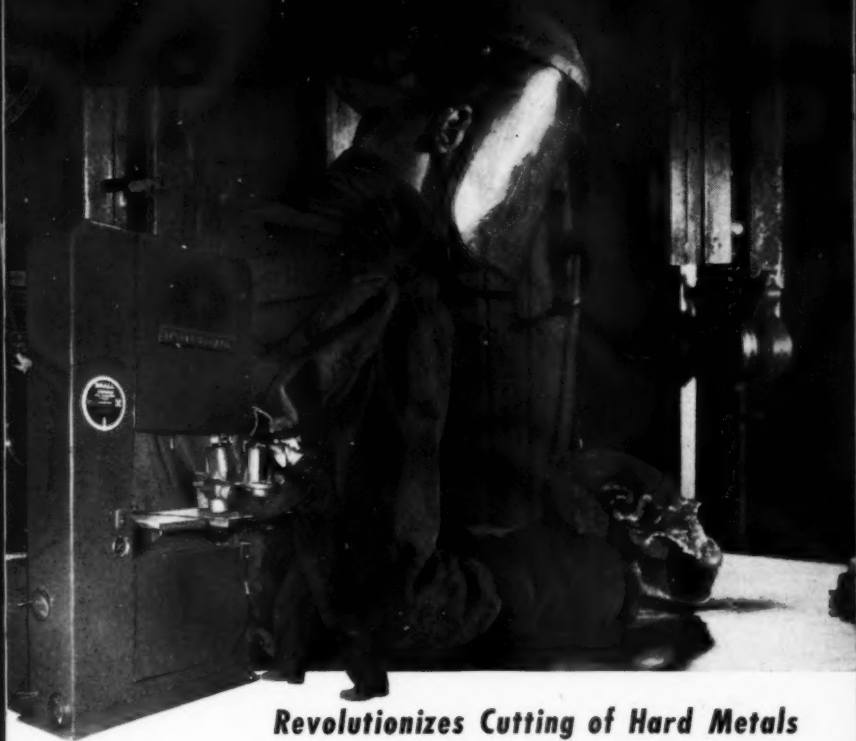
AIR  
PRESSES



**MEAD**  
SPECIALTIES COMPANY

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## Revolutionizes Cutting of Hard Metals

Friction sawing pays big dividends wherever cutting and trimming of metal are large-scale operations. Foundries use it to trim castings in a fraction of the time previously required. Fabricating plants use it to cut stainless steels, alloys, armor and boiler plate, steel tubing and pipe. Even hardened cutting tools themselves like files and milling cutters yield to friction sawing—are sliced in just a few seconds.

In this economical cutting process, the special DoALL Friction Saw Blade quickly builds up the frictional heat between the material and the saw blade traveling at speeds up to three miles per minute. This heat causes material plasticity at a point directly in front of the saw which momentarily softens the metal so that the teeth can strip it away easily.

Investigate how friction sawing can pay you dividends.

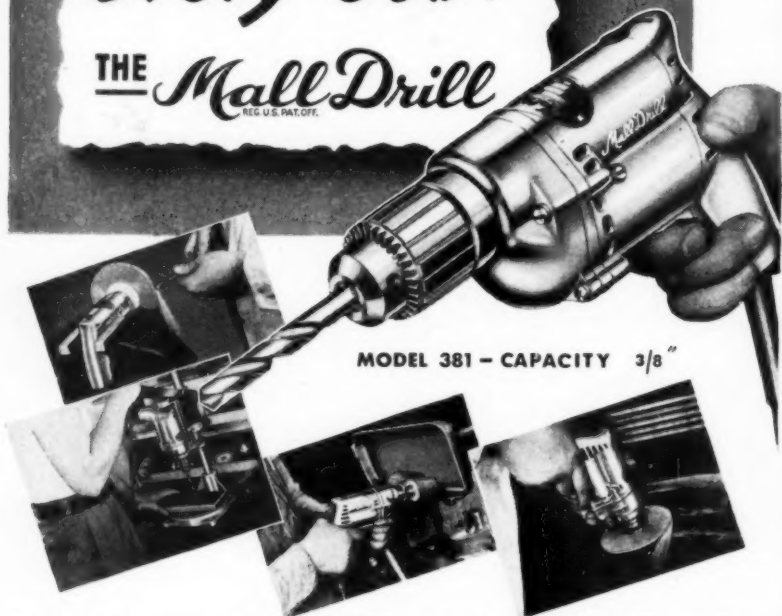
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DIVERSIFIED  
APPLICATIONS  
of  
**DoALL**  
CONTOUR  
MACHINES



### OTHER PRODUCTS

- Saw Bands
- Bandfiling Machines
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- Surface Grinders
- Inspection Equipment
- Punch Presses
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*for*  
**Every Job!**  
**THE Mall Drill**  
REG. U.S. PAT. OFF.



MODEL 381 - CAPACITY  $\frac{3}{8}$ "

Here is a handy portable electric tool that not only provides a drill for all materials—wood, brick, masonry, steel and plastics—but can also be readily adapted for grinding, sanding, wire brushing, buffing and polishing. When held in a vise and equipped with a grinding wheel, it is excellent for sharpening tools; when fitted into a special stand, it converts into a drill press. Other models available with  $\frac{1}{4}$ " to  $\frac{7}{8}$ " capacities.

Ask your Supplier or write Power Tool Division for literature.

**MALL TOOL COMPANY**

**7742 South Chicago Avenue**

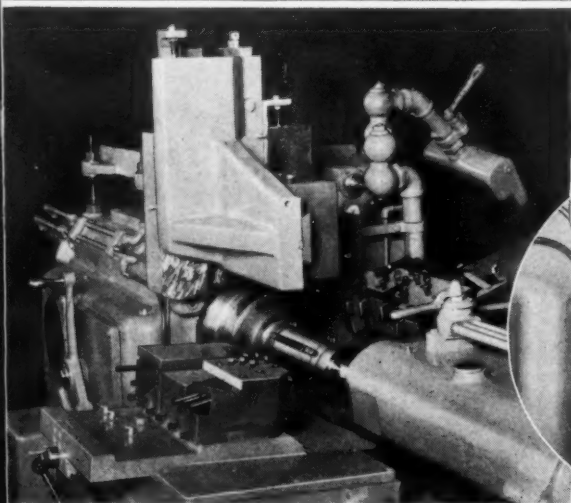
**Chicago 19, Illinois**

**Over 26 Years of "Better Tools For Better Work"**



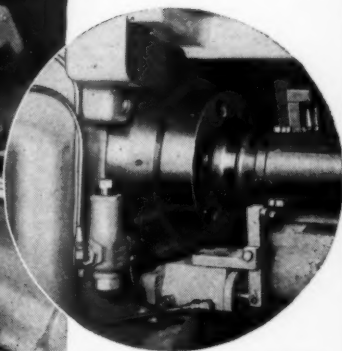
# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK

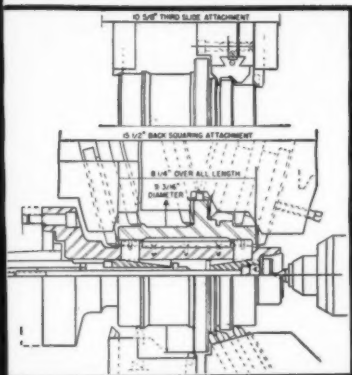


Close-up view of machine showing details of Driving Arbor

Close-up view showing Air-operated Locator



## PRODUCTION SPEEDED ON DRIVE GEAR HUBS WITH MODEL "AR" AUTOMATIC Lo-swing LATHE



**Problem:** To automatically turn, face and chamfer shoulders, and cut groove on Gear Hub with 9" Flange diameter, locating and centering from bottom of spline previously machined.

**Solution:** The Model "AR" Automatic Lo-swing Lathe was selected for this job due to its rigid construction and its demonstrated fine performance with cemented carbide tools.

The expanding, air-operated driver, shown in the line drawing and the main illustration, is fitted with two sets of six driving jaws which accurately center the part true with the bottom of the splines. The jaws are actuated with two independently-expanding bushings and pull bars which equalize the pressure on both sets of jaws. The parts are located longitudinally on the arbor by an automatic, air-operated locator, which moves forward to the exact locating position when the tailstock spindle is withdrawn and relieves when the spindle is advanced.

All diameters are turned with the tooling mounted on the front carriage slide. The squaring, chamfering and grooving operations are divided between the rear and vertical slides in order to simplify the tooling which is used for several different sizes of hubs. The line drawing shows the tooling in detail.

Consult our Engineering Department for Automatic Lo-swing Lathes engineered for your particular turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH S

# Increased Production plus Greater Safety

*— at No Added Cost*



Press-Rite  
No. 12  
12 Ton Press

with  
**PRESS-RITE  
OPEN BACK  
INCLINABLE  
PUNCH PRESSES**

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- Greater Safety for the DIES
- Greater Safety for the PRESS

No greater combination of features has ever been offered in any punch press that will provide such great safety to the operator. . . dies. . . and press. And the improved 1948 PRESS-RITE PRESS line offers this greater safety without added cost and includes such outstanding advantages as:

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3. Anti-friction roller bearings in flywheel.

PLUS large die clearances, frame reinforcements, triple lubrication of ram ways, and many others. Investigate PRESS-RITE PRESSES today. Standard models in 5 ton—10 ton—12 ton—and 30 ton capacity give you increased production. . . low costs. . . plus GREATER SAFETY!

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with  
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Tips



Nupla hammers, with replaceable and interchangeable tips are the only "All Industry" hammers designed to fill all soft-face hammer needs.

Nuplaflex tips are made in three hardnesses and with the Nuplan (nylon) tip, a complete range of four hardnesses are available for all operations, including dual purpose combinations.

Nuplaflex, the amazing "Slo-Resiliency" self-healing material is far more durable than rawhide, rubber, babbitt, lead or wood.

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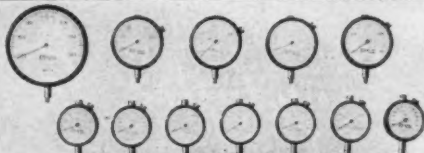
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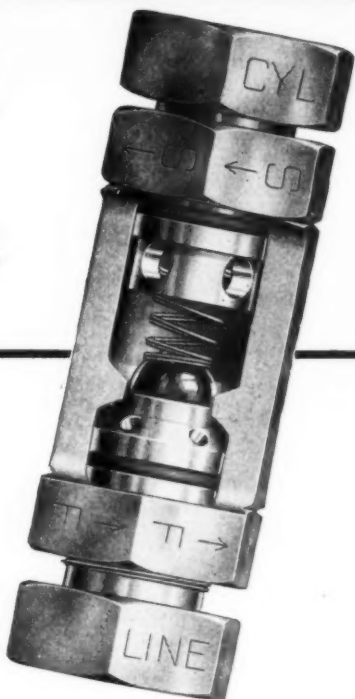
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# Featured in this issue . . . . .

**INVESTMENT CASTING AT ALLIS CHALMERS**, by K. J. Yonker. Production of aircraft turbo-superchargers brought Allis-Chalmers into precision casting during the war. In 1943, Allis-Chalmers installed the equipment, which was patterned after that in use in other plants. But their engineers developed the work and improved the process and the equipment, so that now the company is using the method to produce food processing equipment, cams, levers and thread guides for industrial sewing machines, etc. Page .....121

**REDUCE MAINTENANCE COSTS THROUGH AUTOMATIC LUBRICATION OF MACHINE TOOLS**, by Francis Westbrook. Central lubrication maintains machines in top operating condition, through regular, systematic oiling of all bearings. Correct amount of oil to each bearing is governed by metering units, depending on specific requirements in each case. The distribution system is practically the same for all machine tools, consisting of main line of tubing with branches relayed to parts to be oiled. Page .....131

**MANUFACTURE OF DIRECT DRIVE MOTORS AT KNAPP-MONARCH COMPANY**, by Gerald E. Stedman. The Knapp-Monarch Company of St. Louis, has brought the mountain to Mohammed. This plant like so many others could not get delivery of fractional horsepower motors, so they went into the manufacture of their own electric motors. Their method for making these motors is described in this article. The fact that Mr. Stedman is the first to be permitted to write of Knapp-Monarch engineering, tooling and shop practice makes this article doubly interesting. Page .....143

**SALIENT FEATURES OF HANDWHEEL DESIGN**, by H. F. Williams. This is the fourth and concluding article on Handwheel

Design. Quick manipulation and greater leverage can be obtained by a certain positioning of handles and knobs. During the war, the knob gained popularity over the handle insofar as fingertip control is concerned. While it is not possible to get as firm and positive a grip on a knob as on a handle, the knob can be made free-turning on its own spindle. Page .....153

**USING A COMPANY PICNIC TO PROMOTE BETTER MANAGEMENT - LABOR RELATIONS**, by C. M. Feeney. Employee outings might be termed turnover insurance for the plant sponsoring or encouraging them. Employees become better acquainted with their supervisors and vice versa, and are not so apt to look upon them as "high and mighty" if they have met on equal social levels. Page .....168

**LETTER FROM ENGLAND**. Page .....175

**THE FOREMANSHIP FORUM**, by Edmund Mottershead. The function of a personnel man may include one or all of the jobs of procurement, collective bargaining, and management engineering. The Registered Personnel Administrator is a personnel man who possesses certain basic qualifications conforming to standards set up by the International Research Foundation. Page .....179

**SHOP HINTS**. Page .....182

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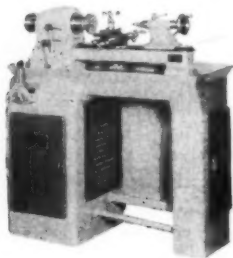
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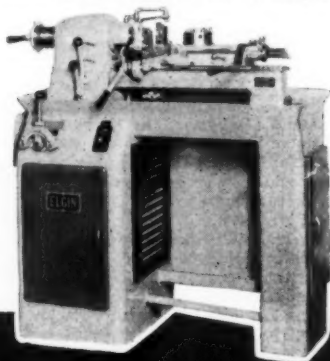


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# As the Editor SEES IT . . . . .

## WAGES AND PRODUCTIVITY

Published in a national business paper recently was this sentence, "While industrial wages have risen anywhere from 80% to 150%, no such corresponding increase in worker productivity has taken place." The writer of this quote is not alone in bemoaning labor's 100% increase in wages without delivering 100% more in production. Linking wages and productivity, i.e., that one should not be raised without a corresponding increase in the other, seems to be a pet theory (one hears it so often) among many writers on business and industrial subjects.

Linking wages to production is a fallacy. Today's wages are not determined by workers' productivity; to believe they are is to think in terms of a feudal economy.

Many, many years ago craftsmen were reimbursed proportionately to their output; thus, a potter who turned earthenware faster than his neighbor received a larger return. Stronger muscles for the blacksmith, nimbler fingers for the potter, longer hours for the harness-maker helped to increase his output and consequently his income. But in every case, production was controlled by the individual craftsman. He could work hard and buy a piece of Venetian lace or he could bask in idleness and live in rags.

Today's industrial worker does not determine his rate of production except within narrow limits of 5, 8 or 10% increase or decrease; he makes no harnesses, pots, or chairs and tables which are exchangeable for vegetables, milk and meat. Instead, he performs one of

hundreds of operations on a product which, often as not, is merely used to make the final and end product. The speed with which he performs his particular operation is largely beyond his control. The machine is the final arbiter of his production. He cannot turn more than 50 shafts a day if his lathe is capable of producing only 50 shafts.

In the early days of metalworking, materials were moved about the plant by muscular giants; the heavier the load, the bigger the pay. Today, pygmies outcarry the gargantuas of yesteryear and are limited only by the capacity and speed of their electric trucks. They cannot tote more than their trucks.

Thus, no matter how much pygmies are paid, their productive capacity is restricted, even as machinists are limited by their machines.

Industry may well ponder this question, "If the wages of workers can rise without resulting in a commensurate increase in productivity, how can business keep out of the red?"

The answer lies in more effective machines. If at present, a lathe turns 50 shafts per day, a worker cannot hope to produce more than 50 shafts. But if a new lathe is substituted capable of turning 100 shafts per day using the same operator, the additional wage paid the worker is offset by his higher production rate.

The machine tool builders are not simply churning the water when they say that production can be increased anywhere from 100% to 500% with the new machine tools. Improved tools will provide the means for equalizing productivity and wages.

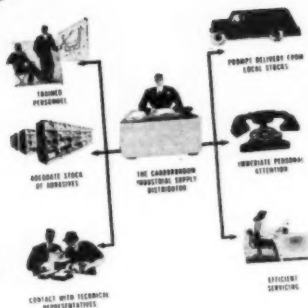
*William F. Schleicher*

Editor

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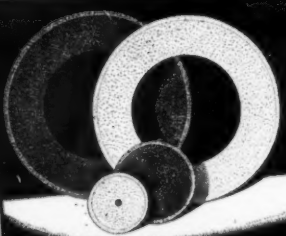

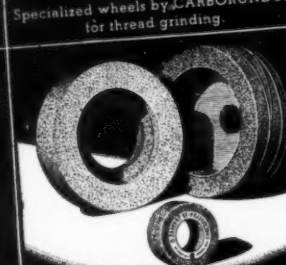



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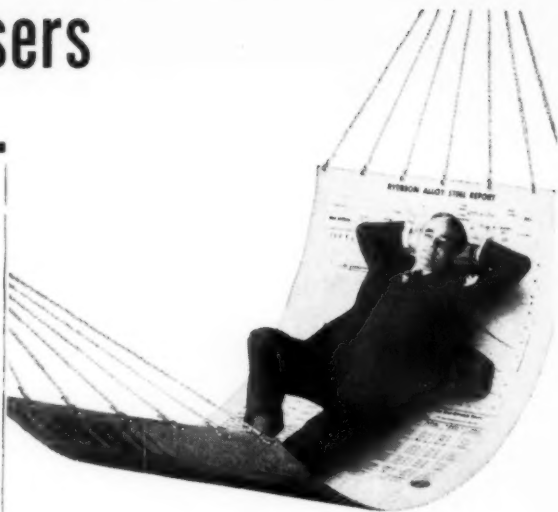
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## HIGH OUTPUT ACHIEVED BY

# *Improved Investment Casting Process*



By **K. J. Yonker**, Application Engineer,  
Allis-Chalmers Mfg. Co., Milwaukee

At the Allis-Chalmers Mfg. Co. a high rate of production of precision castings is being attained by the "lost wax" casting process. Special machines inject wax into pattern molds and the use of special 35-lb. capacity induction melting furnaces are among advances undertaken by Allis-Chalmers. At present about 100 lbs of metal can be poured per hour.

**A**LLIS-CHALMERS was literally forced into the precision casting field during the last war, in connection with its production of aircraft turbo-superchargers. When the company's supercharger plant was built, the accepted method for producing the turbine buckets was forging. But the requirements for greater horsepower and efficiency of our aircraft were causing a trend toward higher and higher supercharger operating temperatures. This forced a change in bucket materials to complex heat resisting alloys which were virtually unmachineable and could not be forged. Supercharger manufacturers resorted to industrial precision casting as a practical method of mass-producing buckets from these alloys.

In 1943, Allis-Chalmers installed precision casting equipment capable of producing 600,000 supercharger buckets a month at its plant, and during the rest of the war, literally millions of blades were cast. To speed getting into production, equipment for this plant was patterned after that already in use elsewhere. However, development work to improve the process and equipment began almost immediately, and in 1944 the company set up a pilot plant at its West Allis Works

to do research and development on precision casting in connection with other war contracts.

The method now has been developed to where the company is producing a variety of castings including those for food processing equipment, intricate cams, levers, and thread guides for industrial sewing machines, and other parts of metals ranging from aluminum bronzes and gray iron to special high-temperature alloys.

With the substitution of a 35 lb. capacity induction melting furnace, in place of smaller furnaces, a more accurate control can be maintained of

the metal being cast. Moreover, casting costs are further reduced because a large number of flasks can be poured from the same load. To-day Allis-Chalmers can pour up to about 100 lbs. of metal per hour.



1. Making a master pattern of a turbine blade. A cast metal die made from the master pattern will be used for injection molding of wax patterns. More commonly, sunken steel dies are used for wax injections.



2. Injection molding of wax patterns with a wax injection machine developed by Allis-Chalmers engineers. Dies are clamped in a pneumatic press controlled by a foot pedal. Wax is pumped into the mold under high pressure. The machine's storage tank, pump, and hoses are surrounded by water jackets in which the water is circulated at a thermostatically controlled temperature, assuring a constant supply of wax at the correct injection temperature at the injection nozzles.

3. Operator is removing a wax pattern from the die and placing it on a tray. The die here used was cast from soft metal which is not as satisfactory as all-steel dies. Soft metal molds are easier to make and permit the plant to get into production quickly.

• • •

4. Hardened wax patterns are delivered on trays to tables where the individual patterns are attached to wax sprues with the aid of heated tools and melted wax. Sprues are specially designed for each type of pattern, to give proper support of the patterns in the flask, to leave passages for drainage of wax as it melts out, to get the maximum number of patterns in the flask, and to provide passages for proper distribution of metal to give sound, dense castings.

• • •



5. Each assembled set of patterns is dipped in a primary investment slurry composed of very fine silica and a sodium silicate binder. Before this coating dries, a slightly coarser silica is sifted over it to strengthen the coat and to provide a roughened surface to which the secondary investment will adhere.





6. Molds are prepared by fastening a pattern group to a bottom plate with wax, setting the steel (18-8) flask lined with water-proof paper over the pattern, and sealing the flask to the plate with wax. The flasks are next filled with investment mixture. This consists of ground firebrick, silica sand, and a small percentage of magnesium oxide. It is blended in the dry state and piped to a rotary mixer where it is combined with the liquid silicate binder.

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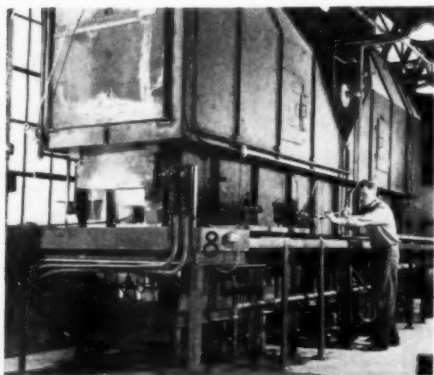
7. The flask is then set on a vibrating table for 30-45 minutes to settle and pack the investment completely around the pattern group. Vacuum treatment to prevent small surface bubbles is not necessary, since the pattern surface has already been coated with the primary investment. This two-coat system also enables a fine grade of investment to be used to form the surface of the cavity into which the metal will be poured, while a less expensive and more permeable material can be used to fill out the flask.

After vibrating, surface liquid is decanted and the excess paper is cut away before the flasks are stored to permit the investment to set.





8. Preliminary wax removal is accomplished on a steam table. The bottom plate of the flask is removed, and the flask is set over a hole on the table. Most of the wax melts out and is collected for re-use in sprues. The flasks then make a 5-8 hour trip through a gas-fired pusher oven, where three zones with temperatures ranging between 200F and 1800F volatilize the remaining wax and pre-heat the mold for pouring.



9. Metal is melted in 30 kva, 9600 cycle induction furnaces, each holding about 35 pounds, and is transferred to the molds by ladle. After removal from the oven, flasks are set on a circular pouring table, which can be rotated to bring each flask to the most convenient pouring position.



10. Standard gravity-head pouring is used almost exclusively, although for certain special designs having very thin sections, vacuum pouring may be used. Since these pouring methods do not limit the amount of metal melted at one time, comparatively large batches can be melted, making accurate metallurgical control possible. In addition, complicated pressure or centrifugal casting equipment is not needed.



the vibration quickly crumbles the friable investment.

• • •

11. After cooling for about five hours, castings are knocked out of the flask by an air hammer. The flask is held firmly by an air-operated clamp while



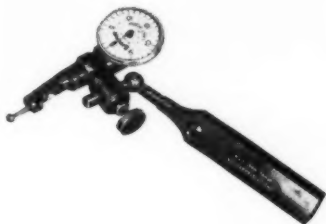
12. The individual castings are then cut apart by special bandsaws, using a standard blade, but which operates at extremely high speeds. It is capable of cutting almost any metal.



# 4 GOOD WAYS TO SIMPLIFY CHECKING and COMPARING



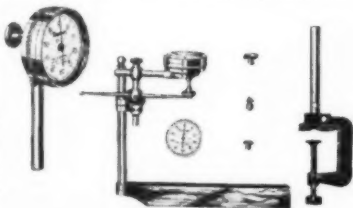
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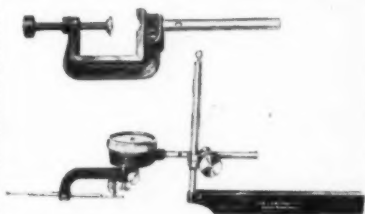
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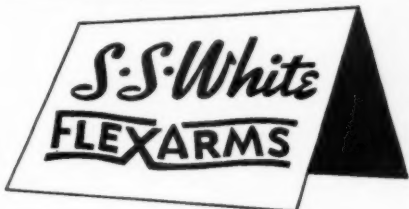
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# REDUCE MAINTENANCE COSTS THROUGH

## *Automatic Lubrication*

### of MACHINE TOOLS



by FRANCIS WESTBROOK

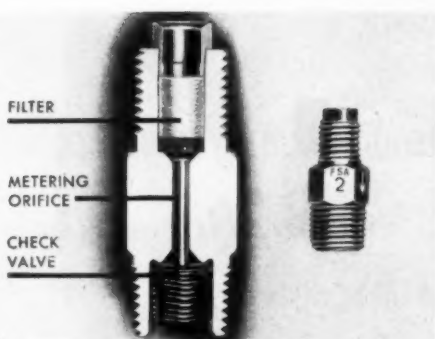
About 60% of the machine tools displayed at the recent National Machine Tool show were equipped with automatic, metered lubricating systems. Central lubrication avoids shutdowns, and by regular oiling of all bearings maintains the machine in top operating condition. Metering units are adjusted to deliver the correct amount of oil to each bearing.

**A**N AUTOMATIC lubrication system of machine tools consists of three main components — a lubricator, a line of tubing and a metering unit at each bearing. The lubricator discharges, with predetermined frequency, a measured quantity of lubricant through a line of tubing branched to deliver oil to every bearing. Metering units are adjusted to deliver the correct amount of oil to each bearing, the amounts being varied to suit specific requirements.

The distribution system, consisting of the main line of tubing with its branches to each bearing and the meter-units, is essentially the same for all machine tools, differing only in layout. It is versatile as to application, having different type units which provide wide latitude for machine designers to meet variations in layout. The standard tubing is 5/32 inches outside diameter by .025 inch wall and is clamped tightly in place to prevent vibration. Junctions are used to branch the main line of tubing to the bearings, and flexible hose assemblies are used to deliver lubricant to bearings on moving parts.

The meter-unit is an oil flow fitting applied to each

Fig. 1. Meter unit located at each bearing to regulate amount of lubricant delivered to it.



bearing to regulate the amount of lubricant delivered to it, according to its needs. A type widely used on machine tools is shown in figure 1. It consists of a felt filter and a metering orifice in which the clearance between the pin and orifice determines oil feed to the bearings. The flow rate and direction of flow are stamped on the unit so that there will be no trouble in selecting a unit with the right feed for each bearing. The third principle element of the meter unit is the check valve which opens when pressure is applied by the lubricator but prevents any return flow from the orifice or bearing. It keeps the distributing system full at all times so that instant feed to the

bearings takes place when the lubricator is operated.

It is to be noted that the control of oil feed by the meter-unit is independent of its distance from the lubricator, the fit of the bearing, temperature variations, changes in oil viscosity or of resistance in the tubing.

The units which supply lubricant to the distributing system are known as lubricators and fall into two categories, automatic and semi-automatic to accommodate different applications. Automatic lubricators are power driven pumps which periodically force controlled amounts of oil to all bearings. The semi-automatic accomplishes the same result by means of a pump manu-

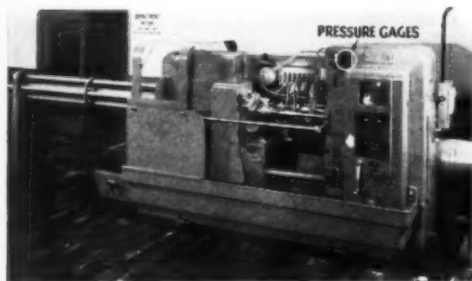
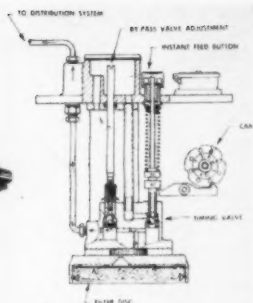
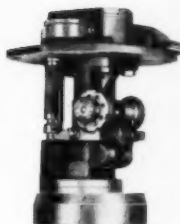


Fig. 2. High speed, multiple spindle screw machine equipped with built-in central lubrication system. Ten spindle and 41 other bearings are lubricated by this system.

Fig. 3. A lubricator which delivers both a continuous and cyclic flow of oil.



ally operated by the machine attendant. All types of lubricators have filters, and all of the systems are completely sealed for the exclusion of dirt and grit.

Three different types of automatic lubricators and two types of semi-automatic will be considered by explaining how and why they are applied to various machine tools to secure the best results. As a general thing it is preferable to incorporate the lubricating system into the design of the machine and for the builder to install it.

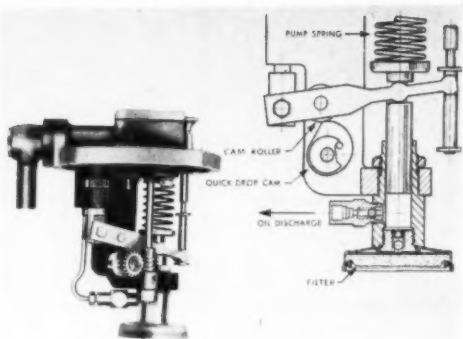
Figure 2 shows a Warner & Swasey 5-spindle automatic bar machine with built-in central lubrication. This multiple spindle high speed automatic screw machine has been designed with adjustments to enable it to be set up economically for short runs, and the central oiling system plays an important part in its economical operation and maintenance. Ten spindle and 41 other bearings are serviced by this system. The lubricator is driven by the machine and is mounted on the oil reservoir built into the drive end. Two distributing lines carry controlled amounts of oil from the lubricator to

all 51 bearings. The meter-units apportion the correct oil-film to each bearing individually. As is the case with all properly designed central oiling systems only clean lubricant reaches the bearings, which of course helps greatly from the maintenance standpoint.

One of the two distributing lines provides a continuous flow of oil to the spindle bearings and the spindle drum. The other distributing line provides a cyclic oil feed, lubricating the other 41 bearings periodically at high pressure. Each line has a pressure gauge in plain view to show at a glance if it is functioning as it should.

The one lubricator delivers both the continuous and cyclic flow of oil. It is shown in figure 3. It contains a continuously operating gear oil pump. The oil is diverted into the distribution system at predetermined intervals by a cam. The contour of the latter determines the timing and duration of the oil feed. These are varied according to specific needs by changing the setting of the two parts of the cam with respect to each other. Indexed holes indicate the amounts which will be delivered by each setting.

**Fig. 4. Cyclic lubricators; power operated and fully automatic.**



A rocker follows the contour of the cam and the former operates a timing valve in the pump housing. This combination provides for the delivery of the measured amounts of oil to the system. There is also a by-pass valve which may be adjusted while the machine is in operation and by which small changes in the amount of oil delivered may be made. The instant feed button at the top of the lubricator permits flushing all bearings when starting a new machine. The pressure developed is in the range from 50 to 100 pounds per square inch. Alternate gear ratios are supplied to take care of different drive speeds.

A simpler type of lubricator is shown in figure 4. This is suitable for many applications such as the Peerless Mechani-Cut Saw, figure 5, some vertical milling machines and presses. This type is known as the cyclic lubricator and consists of a spring discharge piston pump operated by a cam driven from the lubricated machine. The cam is rotated by gearing which slowly raises the piston and draws a specified amount of oil into the cylinder. Discharge of oil into the distributing system takes place under the action of the spring which is compressed as the

cam raises the piston and is released at the top of the stroke.

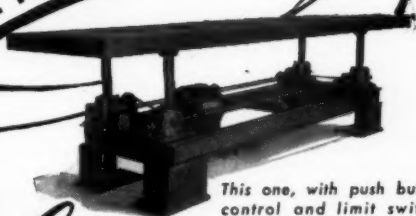
The time cycle is determined by the reduction gearing built into the lubricator. The length of the piston stroke may be adjusted for a discharge of oil of from one to two cubic centimeters per stroke, the normal being 1.5. For the machine tool shown in figure 5, the lubricator discharges 60 drops of oil every four minutes to the 22 heavy duty bearings and ways. Variations of this type of lubricator are available for reciprocating drives.

The third type of automatic, or power-operated, lubricator is usually referred to as the continuous type. This is a small non-adjustable piston pump assembled in an oil reservoir in the machine and may be operated by an eccentric, cam or reciprocating part driven from the tool which it lubricates, figure 6. When the machine is in operation the lubricator forces a measured amount of oil into the distributing system which is then apportioned through the meter units according to the individual requirements of each bearing. This type of lubricator provides a continuous flow of lubricant to the bearings, as distinguished from the periodic application by the cyclic

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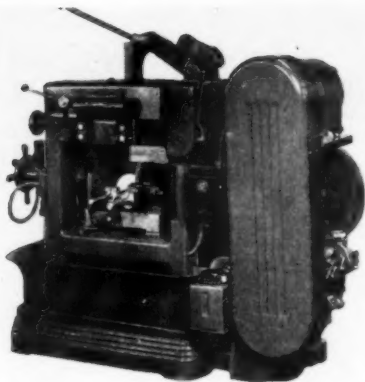
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Fig. 5. A saw equipped with cyclic lubricator, located at the lower right between the machine and the chain drive housing.

• • •



types of lubricator.

The two continuous lubricators shown in figure 6 are similar in operation but differ in some details of design to meet varying conditions. The smaller one at the left is the type used for the Jones & Lamson turret lathe shown in figure 7. This machine tool has a lubricator built into each saddle to feed oil continuously to the turret, saddles, bed ways and cross slide ways.

There are two types of semi-automatic lubricators used for the central lubrication of machine tools. They are frequently referred to as "one-shot" lubricators. One is built into the machine reservoir and the other is built integral with the reservoir, or all in

one piece. Both are operated manually by means of a plunger or lever, to force a measured amount of lubricant into the distribution system and thence through the meter-units to each bearing. Obviously these types are for conditions where the application of lubricant is required only at long intervals and where there would be little point, if any, to employing the automatic type.

The first of the two semi-automatic lubricators, the one built into the machine reservoir, has a spring discharge pump operated by pulling up a handle which raises the piston and compresses the spring. When the handle is released oil is automatically discharged into the system and through the meter-

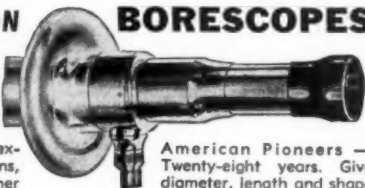
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units to each bearing as with all the other types of lubricators. The work head cross slides of Bryant chucking grinders are oiled by this type of lubricator.

The second type of one-shot, semi-automatic, lubricator, forming an integral part of the reservoir, has a spring-actuated pump controlled by the manual operation of a handle, figure 8. It functions much the same as the type just described. Figure 9 shows a

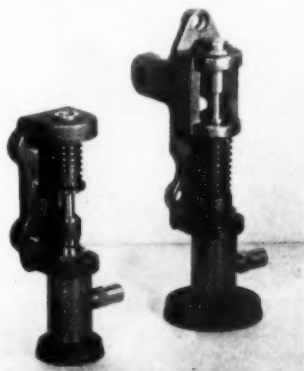


Fig. 6. Automatic, or power operated continuous lubricator. The smaller one, on the left is used on the Jones & Lamson machine, figure 7.

• • •

Gallmeyer & Livingston hydraulic surface grinder equipped with one of these units (lower right, attached to base). One discharge from the lubricator feeds oil to 22 bearings, gears, table and saddle ways. All that it is necessary to do is to push down and release the handle, which is adjustable to regulate the charge between 4 and 32 cubic centimeters per shot, with a discharge pressure of 60 pounds per square inch. Other forms of this type of lubricator



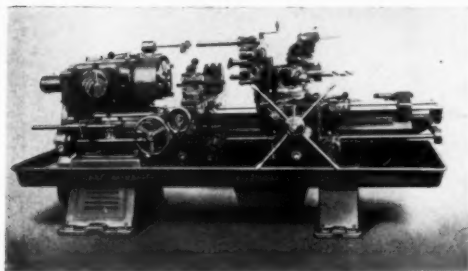


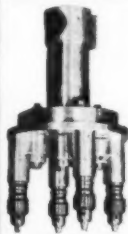
Fig. 7. Turret lathe equipped with two continuous type lubricators. One is built into each saddle.

have other limits as to pressure and charge so that it is not difficult to make a suitable selection for different machines, with a view to economy and efficiency.

Another type of central lubrication system is shown schematically in figure 10. This is operated by an individual motor but other models provide for manual operation of the pump. It is used with success on turret and crank shaft lathes, and some other machine tools. Basically the system consists of a pump and feeder sections, connected by tubing. Each section serves a certain number of bearings by means of an individual pumping or measuring piston which delivers the necessary amount of lubricant required by the individual bearing.

The feeder sections may be bolted to the machine housing as is most con-

Fig. 8. One shot semi-automatic lubricators forming an integral part of the reservoir.



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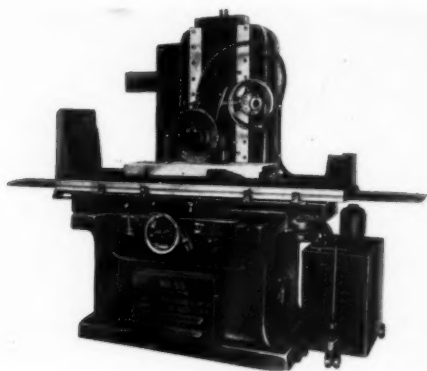
This type of adjustable head can drill holes in circular, straight line or staggered formation. The minimum circle obtainable with this No. 1 AC size is 2", maximum circle obtainable 7". When head is furnished with drill chucks, largest size drill,  $\frac{1}{4}$ ", when furnished with taper holes in the spindles, largest drill is  $\frac{9}{16}$ ".

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• • •  
**Fig. 9. A hydraulic surface grinder equipped with one shot central lubricator.**  
• • •



venient. Practically any number of bearings (from one to a few hundred) on one machine or several machines may be served from one pumping unit. The system handles all standard types of oil or grease.

The reliable makers of central lubrication systems have done a great deal of research and development work with respect to the application of their product to various kinds of machine tools and this is all available for the

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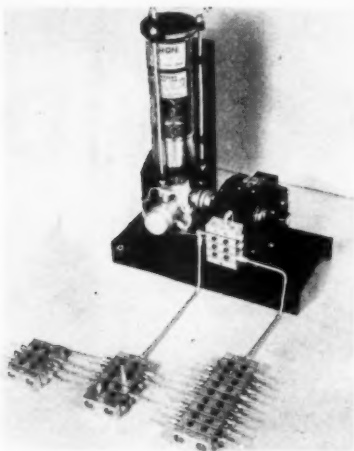


Fig. 10. Motor driven pump with adjustable oil or grease discharge ranging from zero to 31 cubic inches per hour. The main flow of lubricant is directed via the main line to a master feeder or distributor thence to subsidiary feeders located about the machine in spots conveniently accessible to the bearing points. Each feeder can serve from two to twenty-two bearing taps and each outlet provides the correct shot for each bearing depending on size, load and type of bearing.

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benefit of prospective users. As this is a highly specialized matter it is strongly recommended that those considering the use of such a system take advantage of the manufacturers' engineering facilities and experience, which are theirs for the asking. THE END.

(Photographs courtesy: Bijur Lubricating Corp.; Gallmeyer & Livingston Co.; Peerless Machine Co.; The Warner & Swasey Co.; Jones & Lamson Machine Co.; Trabor Engineering Co.).

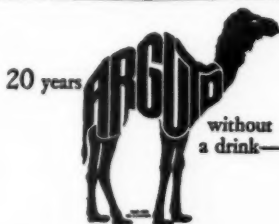
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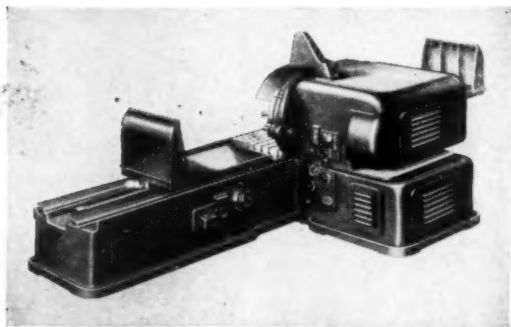


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## MANUFACTURE OF DIRECT DRIVE MOTORS

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### *at Knapp-Monarch Company*

By Gerald Eldridge Stedman



Faced with difficulty of procuring enough fractional horse power motors to meet their requirements, this company is now manufacturing its own motors.

MANY MANUFACTURING plants today which require the use of fractional horse-power electric motors for their products are in serious difficulty, since deliveries on the vital accessories are months behind schedule. Here is the story of a large plant which has met the challenge of indefinite and uncertain delivery dates and has gone into the manufacture of its own electric motors—the Knapp-Monarch Company, of St. Louis. This firm produces a wide line of small electric appliances, many of which are motor-driven, such as mixers, liquidizers, hair dryers and fans. The operational sequence of fractional induction motors is described in detail in the following article. No one has previously been permitted to write of Knapp-Monarch engineering, tooling, and shop practice, which enhances the value and interest as well as the timeliness of this article.

Knapp-Monarch small electric appliances are distinctive for their styling and use-tested efficiency. Some of the motor-driven appliances are assembled with varied types of heating elements, requiring precise engineering of load tests and table-top temperatures. Knapp-Monarch maintains a complete experimental, Kitchen-testing laboratory that incessantly

probes, discards, and evolves new products and performance data under actual use conditions. The engineering of all K-M motor driven appliances is under the direction of George Moeller and his staff.

Knapp-Monarch reverses the practise of developing from the drafting board to eventual models, but instead it develops from models to final board detailing. Moeller and his staff pass judgment on mock-ups to estimate style-pull, or test operating models in the experimental laboratories before they get down to drawings.

As an example: previous to a recent K-M improvement, the two beaters on a food mixer were held in place by frictional devices that would change in holding characteristics due to constant insertion and ejection of the blades. These failures caused the user to get her hands into messy dough in order to extract the lost beater members. K-M experimental kitchens caught this design error. Moeller's engineering developed a blade, holder, and release for the beater mechanism, which, by pushing a button, unlocks the tandem blade shanks. A cutaway on the beater shank is anchored to a phenolic lever, held by spring action.

There are many tests in motor-driven developments which pertain to power requirements, voltage, underwriter's specifications, temperature, motor and housing and competitive factors. All these are the responsibility of the engineering department.

Actual fabrication of any Knapp-Monarch product is almost entirely the responsibility of the factory Lay Out Department, under direction of Richard Burgdorf, chief industrial engineer, who works in close association with his superior, Edward Schmid, factory manager.

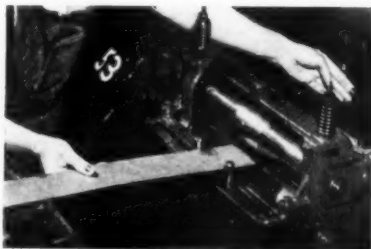
Activities involved in K-M induction motor fabrication chiefly embody the

production of stator and rotor laminations and their assembly, the winding of fields, and major assembly of the wound field, rotor and bearings.

"The oldest known method of joining end rings and side coppers with conductors in producing induction motors," Mr. Schmid explained, "is by soldering. When K-M took over the production of motors, volume was increased through improvements over this old method. We used a solder pot into which parts were thrown, extracted, and brushed off, cooled in a water quench. Then a machine was developed that was like a wheel on a Mississippi stern-wheeling ferry boat. Work tumbled from the presses into a gravity chute and was shoved along by paddle action from acid into solder into cold water rinse. The drawback was that the pieces stuck together in the water quench. Globules of solder were thrown off which disturbed the rotating balance required in rotor action. Because of the nature of the work, this paddle machine wasn't durable. A further new idea was instigated. We electrolytically tin plated conductor and end rings separately, then assembled them together. Then we put them through a bath of Tinfoil oil at 650°F. which fused them together without any of the scrap

• • •

**Fig. 1. Operator is feeding special laminated stock into an H & W automatic press which will stamp out motor parts.**



and imbalance of the old method.

"This new method has great advantages, since acid fumes, soldering operations and dirty working conditions that were hazards to operators have been eliminated. Fumes previously corroded, oxidized, and rusted all equipment in the immediate vicinity. We now avoid waste and rework of parts out of balance. By this new method, the rotor assembly is clean, with no excess of solder. Assembly achieves high inspection scores in good balance."

Mr. Burgdorf, responsible for factory layout and routing on this motor fabrication, spent several hours explaining procedure at machine side. Though industrial engineer for all plant operations, and also in charge of its time-studies, he knew how to operate each machine expertly. Since the plant was closed, his demonstration was the only way he could show operations.

Upon questioning, Burgdorf further stated: "The silicon - rich lamination stock for rotors and fields is furnished in coils or sheets of .035" ga., hot rolled and pickled. Sheets are usually received 108" x 30", and are sheared into lamination sizes of 2-1/16" x 3 3/4" width, maintaining the 108" length." (Fig. 1) The battery of shears is located directly in front of lamination presses. Work is sheared and moved to them.

Lamination punching is accomplished on a Henry & Wright automatic dieing machine, using five-step progression. Rotor laminations are blanked from the center of the field or stator blank laminations at the same press stroke. An air gap is trimmed from the field center to permit pilot location. The progressive phases of the dies accomplish a sequence of stator blanking, perforation, rotor blanking, trim and final blanking. The work moves from machine into trayed chutes which are de-

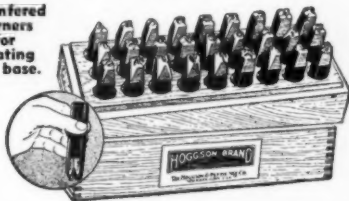


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locating  
the base.



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• • •

**Fig. 2. This machine both punches and twists, accomplishing a further step in the rotor assembly for K-M appliance motors. Operators are assembling rotors for twisting.**

• • •



signed to fit the varied dimensions, the work being segregated into rotor and stator parts, which are stacked in these trays about three feet long, each having the width of either rotor or field piece.

Rotor and stator laminations come to separate sub-assembly benches. The rotor pieces, in their stacked chutes, are placed in a manually operated fixture which feeds out by coin-slide lever, selecting the proper number of rotor laminations for the particular sized inductor motor assembly involved. Two end coppers are stacked against this selection, one on each rotor end.

This manually assembled rotor is then placed in a die on a No. 3 Federal Special with a die height of 15", equipped with a safety sweep guard, and accomplishing a production of 1000 pieces per hour. The die has a helix angle on the shank, the conductors are riveted over and the rotor is given proper angle at one twist of the press stroke. This is a K-M tooling development. The twist of this stroke gives enough spread to the rivets to make adequate electric contact with the field (Fig. 2).

The same process is involved in the stator assembly with the exception that the field has no end coppers and there is, therefore, no requirement for spread or twisting. It is an ordinary riveting operation accomplished on a No. 4 Marshalltown, at 1000 pieces per hour (Fig. 3).

Next, stators are given an alkali wash in the plating department. This removes all oil, chips, and foreign substances that might have entered the field assembly.

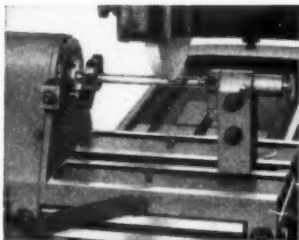
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**Fig. 3. Riveting stator (field) assemblies for K-M electric fan motors.**

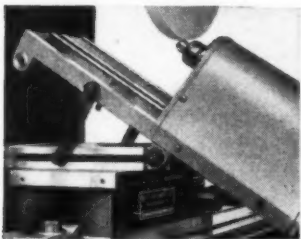




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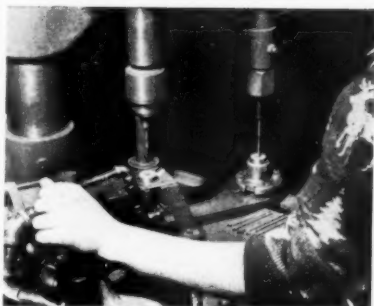
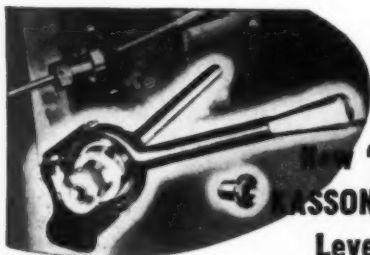


Fig. 4. This dual fixture drill press is used to ream and assemble rotors for K-M hair dryer motors. Holding fixtures are air-operated.

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and is chamfered. Fractional dimensions are involved in shaft length. This work is on a Brown & Sharpe screw machine. The shaft then goes to the



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**Fig. 5. Stator coils being precision wound, to assure better finished motors for K-M fans.**  
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press room for splining on a No. 3 Marshalltown punch press. All parts are then moved to stock.

Stator coils are wound on automatic winding machines, eight coils to a spindle (Fig. 5). These machines are air-operated. Each girl operator takes care of three machines. She keeps 12 spindle fixtures employed, each with 8 coil winding divisions. She inserts a spindle and moves to the next machine. In such gang winding, when the progression of each spindle winding is completed, she removes and lays it on the bench behind her, where another operator ties the coils, using a forking tool to insert the thread. She strips coils from the fixture, reassembles and restores the emptied spindle to the winding operator's bench for the next cyclical movement. Production here is 1000 coils per hour.

The wound coils then proceed to the taping bench for sleeve and tape, a manual operation, production being about 200 coils per hour. These wound coils are then inserted into the stator. Magnetic wedges are inserted into this field. The coils are connected in this field and tested for shorts and grounds.

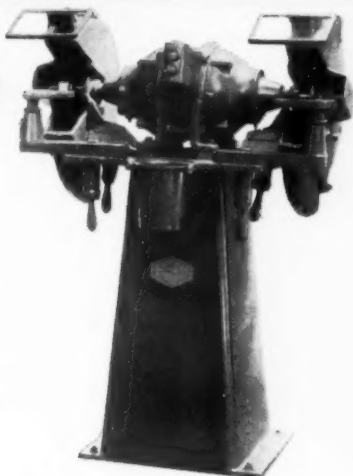
This operation is accomplished on an octagonal table; the center of which is a large, rotating disc. The table is 10 feet in diameter, with a 6 foot diameter disc. Each girl operator lays her completed work on the moving disc which acts as a temporary storage, and moves work from one station to the other. This revolving disc eliminates a weakness of straight-line delivery in that often one operator cannot complete her function, and misses the delivery from the preceding station. With revolving delivery, this failure makes no difference, since the incompleting work returns to her.

The work then moves to the final motor assembly bench where the bearing brackets are assembled, using self-aligning, oil-less bearings. The rotor is assembled into the stator. Bearing brackets are assembled onto the shaft. Bearing brackets and the field are riveted together on a small bench press. The bearing bracket assembly is accomplished on foot-operated kick presses of Knapp-Monarch design. The final assembly is inspected for speed, short circuits, grounds, and end play. The motor is then passed to the main assembly lines for installation in hair dryers, fans, or whippers.

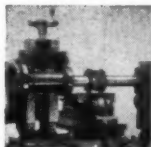
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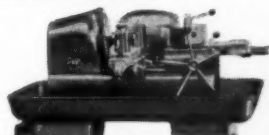


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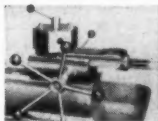
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## SALIENT FEATURES OF

# Handwheel Design

By H. F. Williams

This is the fourth and concluding article on Handwheel Design. Previous installments appeared in December 1947, February and April 1948 issues of the MACHINE and TOOL BLUE BOOK.

The positioning of handles, knobs and knobbed handwheels is important. Where fine adjustments are necessary and finger-tip control is desirable the knob is slowly replacing the handle. The airplane type of handwheel is being used on some machine tools for ease and control of operation.

**W**HILE HANDLES and knobs placed on the handwheel parallel to the hub or shaft axis provide means of quick manipulation, those placed on the handwheel radially or angularly provide greater leverage and control over close positioning and fine adjustment. Knobs have been used for some time at the ends of radially placed rods or studs but it was only during the war that knobs were used for quick positioning where the knob spindle is parallel to the axis of the wheel. While it is not possible to get as firm and positive a grip on a knob as on a handle, nevertheless the knob has been applied where finger tip control is featured. A close-coupled assembly can be obtained with the use of a knob, especially where it is placed on a very short shaft or spindle so that overhang is down to a minimum. The knob can be made free-turning on its own spindle so that a firmer grip can be had on the knob. In this instance the knob turns free on its shaft and does not have to slip in the grip of the hand and fingers.

The most commonly seen application of a handle to a handwheel other than when both axes are parallel, is to place the handle radially on the rim. This radiation is merely an extension of the spoke, the junction of the rim and the spoke being the most logical and strongest location for the handle. This application is illustrated in Fig. 115. Were it not for the fact that the rim is sometimes grasped by the operator, a handwheel with radially placed handles could very readily be eliminated and a spider handle used in its place. However, the subject

of the latter type of handle will be discussed at a later date. The radial handle is usually made of mild steel with threaded shank screwed into a slightly counterbored hole in the rim. Sometimes the handle has a straight shank and is pressed into the rim. Of the two, the former type probably is preferable from a standpoint of replacement and tightness in the hole. Unless the spoke is built up to receive a more deeply drilled and tapped hole, it is usually customary to have a shallow hole tapped with a plug or bottoming tap. While any shaped handle can be used, the most seen are the ones with bulbous ends as shown in Fig. 115.

In Fig. 116, four, five or six radially placed handles are used on a flywheel-type of hand-wheel rim. The length of the handle is somewhat greater than is used on the conventionally shaped rim. The threaded end of the handle can be longer also because of the greater thickness of the rim. In this instance a tapered handle with round end is used.

In applications where the torque is low, a handwheel as shown in Fig. 117 can be used. The wheel is solid and has four radially placed handles, cast integrally. These handles are conventional-cylindrical in shape, tapered slightly

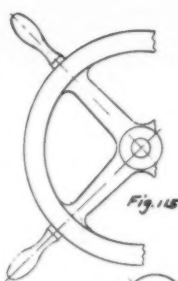


Fig. 115



Fig. 116



Fig. 117

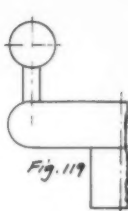


Fig. 119

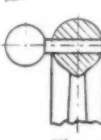


Fig. 118

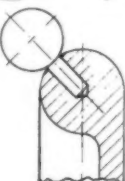


Fig. 120

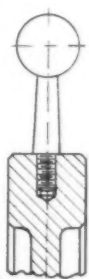


Fig. 121

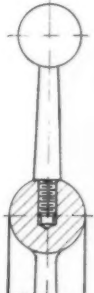


Fig. 122

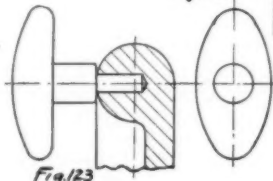
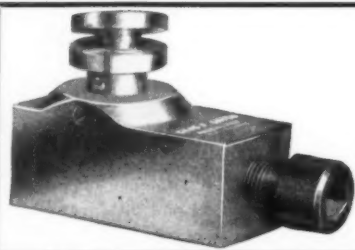


Fig. 123

inwards. Although the illustration is conveniently sectioned as cast iron, it might be well to reverse the taper on the handle so that the strength of the wheel is enhanced. This would place the heavy section where the rim and handle joins. Another way for additional strength is to let the contour as shown and elongate the section in the other direction. This



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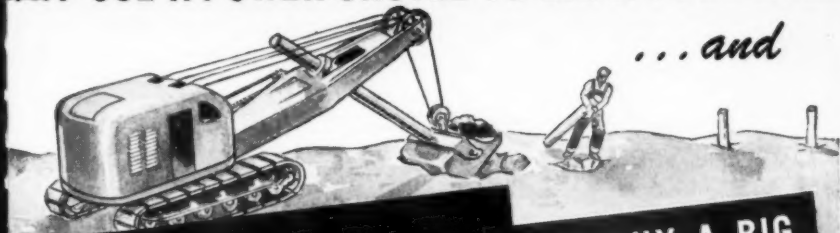
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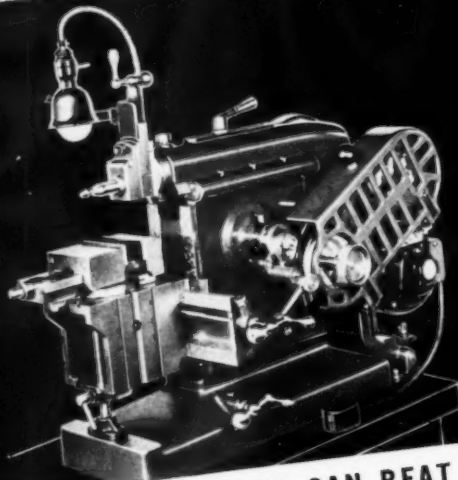
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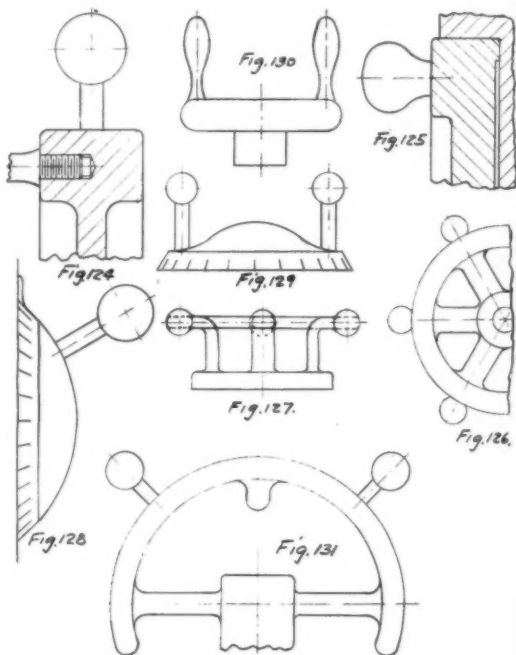
would allow a turning or facing operation to the tips of the handles, with subsequent polishing of the rounded edges of the handles. However, it is not necessary to finish at all, but simply paint the complete handwheel. The two grooves in the left hand face are simply ornamental. These run around the whole face and can be painted a lighter or darker color to accentuate motif when so desired.

Handles placed radially and perpendicularly on the rim of the handwheel, in some instances, are fast giving way to the knob. Whether this knob is of hard rubber, plastic or metal, it is felt by some designers that greater neatness is attained by its use. Where finger-tip control is featured, the knob fits into the scheme of things very nicely. Various illustrations from here to the end of the article will be shown intermittently. Four positions are given for the knob in Figs. 118 to 121 inclusive. In Fig. 118 the knob spindle or stud is parallel to the axis of the handwheel. In this case it is placed close to the rim so that overhang is reduced to a minimum and is fastened solidly on its stud. Other designs further on show the knob farther away from the rim but in this instance compactness was the keynote. In such an assembly, finger-tip control may be fully enjoyed by making the knob free turning, that is rotatively free on its spindle. In the former method as in the case of the conventional handle, the knob must slip between the thumb and fingers, especially when close coupled, as a revolution of the handwheel is made. In the latter case, however, namely when the knob is free, it may be gripped between the fingers and thumb, held tightly, and the handwheel spun.

Knobs made of hard rubber or other types of plastic materials are made in several designs and in many shapes. They can

be cast either with molded threads or formed with metallic pre-threaded inserts firmly anchored in the knob. The solid type simply screws on a stud which either bottoms in the threaded hole or screws against the imperfect threads left by the chaser. Sometimes a cement is used to hold the knob more securely on the stud. The other end of the stud is either threaded similarly into the handwheel rim or left plain and pressed in. In the free-turning knob a loose sleeve is placed on a shouldered stud and the sleeve screwed into the knob. This sleeve has a running fit on the stud.

While the axis of the handwheel in Fig. 118 is parallel to the floor, in Fig. 119 it is perpendicular to the floor line of the machine. This seems to be a favorite method of handwheel manipulation, especially where the wheel is placed approximately at eye level or higher on the machine. When a handle is gripped, the whole hand is used, but when a knob is



gripped only the thumb and fingers are used. Therefore when a handwheel is in an elevated position on the machine, the knobbed handle functions with greater ease. The stud is usually somewhat longer to give a greater distance from the rim to the knob.

In most instances, knobs having a plain smooth surface are used satisfactorily. However they are available with several flutes in the periphery perpendicular to the axis or are sometimes straight-knurled for a better and more positive finger grip. While the truly spherical shapes are most commonly used, occasionally other forms are used. Any manufacturer's catalog of plastic knobs shows a multitude of shapes, contours and colors.

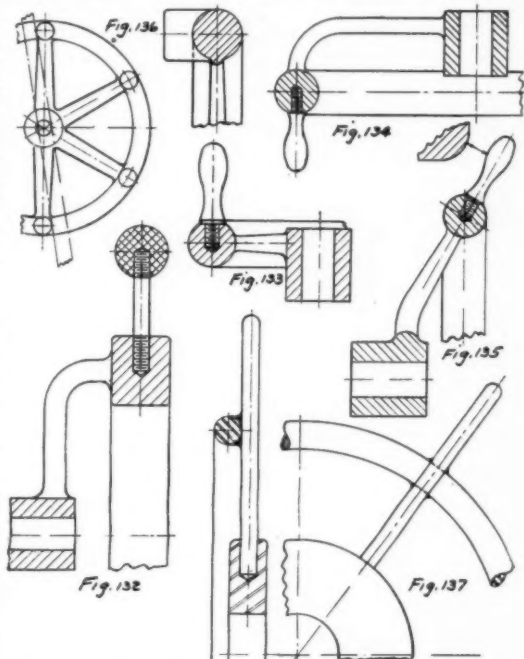
The design illustrated in Fig. 120 is really more of a large knob than a handwheel as it fits into the palm of the hand. Four plastic knobs are placed around the rim, the studs of which enter the rim at a 45° angle. The handwheel is flanged rather than being spoked. The knobs act as finger stops much the same as a scalloped rim. They are placed 90° apart.

In Figs. 121 and 122, the fourth position of the knob, as applied to handwheels, is shown, namely in that it is placed radially. The stud is tapered on the body although sometimes it is left one diameter, the latter being less expensive to make. In the squared rim only a tapping operation is necessary while in the rounded rim, a spot-counterboring operation must be added. In some designs such studs are counterbored deeper into the rim so that all the load is not concentrated at the root of the last thread but rather on the heavier body of the stud. Some handwheels have 4, 5 or 6 such knobbed handles.

For a close-coupled, yet positive grip of

the knob, the handwheel in Fig. 123 is interesting. The wheel itself is of the solid flange variety and has an oval knob made of metal. The knob is free on its spindle so that it may be gripped firmly in the palm of the hand and the handwheel rotated. This design can be used to advantage where the direction of rotation of the wheel is away from the operator or of course in the opposite direction also.

The handwheel in Fig. 124 is really a combination type in that it can be used conventionally by gripping the handle that is fastened parallel to the axis of the wheel. The squared rim, having a rectangular section, gives the wheel a flywheel action. In this rim, placed 90°



apart are four short studs with hard rubber knobs attached. These knobs facilitate the spinning action and two knobs can be gripped with both hands to give a final tightening action to the screw

upon which the handwheel is mounted.

In another design of handwheel having flywheel action (not shown), the engineer cleverly incorporated a hammer-action for use on a vise-type of mechanism. The square section rim has an extra lump of cast iron, integrally cast at the end on one spoke where it joins the rim. When the work is put into place, one of the four knobbed handles is grasped and with a flick of the wrist, the wheel is spun. As the jaws grip the work, the handwheel comes to a stop, the stored-up energy in the unbalanced rim, tends to give the jaw screw an extra jerk, thereby making it unnecessary for the operator to again grasp the knobbed handle for a final tightening operation.

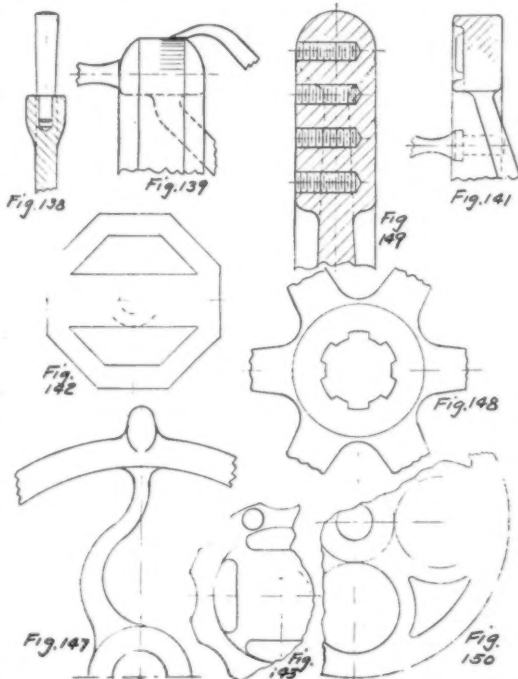
Sometimes it is desirable to mount a handwheel so there is no overhang whatever with perhaps exception to the operating handle. Handle overhang can also be reduced by the use of a knob as shown in Fig. 125. The handwheel itself nests into a counter-bored opening and in this instance bears against the opening near the outer periphery beyond the recess. Handwheels of this type have been observed in which the front face was highly polished while the part into which they fitted was lacquered black or some other contrasting color. In any event the whole assembly is very much close-coupled and extremely neat in appearance.

At times, handwheels are no larger than hand knobs or possibly slightly larger, but they still retain the shape of a handwheel. In Fig. 126 is illustrated a wheel that can fit into the palm of a large hand. It has six spokes and six knobs but these knobs are cast integrally and not attached as usual. These knobs act as finger stops or grips. This handwheel was painted from the rough although it could be sandblasted or buffed

and left natural.

The crown-shaped handwheel in Fig. 127 is quite unusual in design in that four knobs are placed at the ends of four right angled spokes as shown. The fourth spoke towards the reader has been left out of the sketch. These knobs are connected by a band of cast iron, also cast integrally into which the spokes and knobs are blended. It is obvious that finger room is not found wanting in this design. The hub is large and only diagrammatic in the sketch.

Dials are used to a great extent in



conjunction with handwheels. In fact more often than not, the dial and handwheel are one and the same. In Fig. 128, the large dial has a handle mounted in its rounded face surmounted by a knob. Setting of the dial is accomplished by the knob, but rapid rotation is also possible when it is used as a handle. The knob in this design is made of

metal with the stem attached. A pointer is seen at the top of the drawing against the angular face of the dial.

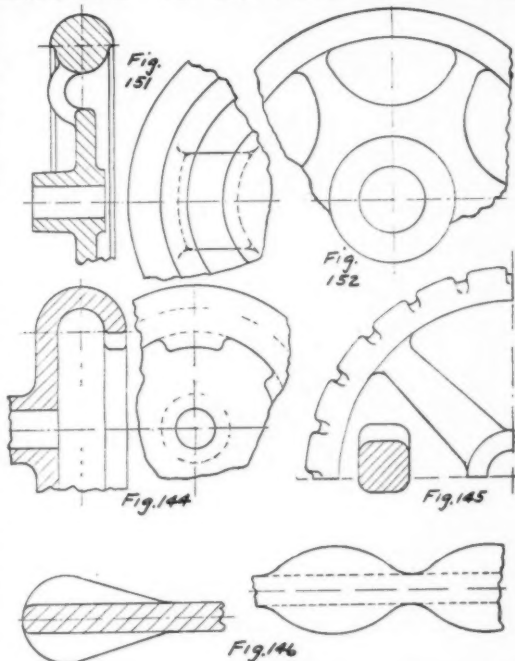
Sometimes a large dial or small handwheel is mounted in a vertical position as is shown in Fig. 129. In some instances a single knob or handle will not function conveniently so that two hands are required for accurate setting, especially when the wheel is placed about eye level. Plastic knobs are used on the studs while in Fig. 130, the small handwheel is equipped with two machine handles. In the latter design, the span of the handles was within the grip of one hand but at times it was necessary to use two hands for proper setting. Farther on in this installment, graduated handwheels will be discussed further.

The now-familiar airplane type of handwheel or half handwheel as shown in Fig. 131 has been applied to machine tools. About two years ago two of these wheels appeared on the new design of a well known make of vertical miller. Located centrally for ease of operation they were used to give an infinitely variable feed rate to the table in both directions. This wheel is easy to grip. While the two spokes connect the rim to the rectangularly shaped hub, a finger stop is placed at the top center. Two knobs about 90° apart also facilitated operation and close setting. As in this case, when a complete revolution of the handwheel is not necessary, a half-handwheel lends itself readily to fit into numerous designs.

An offset type of flywheel action handwheel is illustrated in Fig. 132 and can be used where greater clearance is necessary or when it is desirable for the knobs to be within easier range of the operator. In this particular design, the six spokes were attached to the rim at the center of the rear surface rather than at the inner periphery of the rim. The six knobs

were screwed onto studs in line with the spokes.

As referred to in Fig. 119, it is of greater convenience to the operator to have a knobbed handle than a conventional machine handle, especially when the handwheel is in an upright position as in Fig. 133. This sketch represents an actual installation. The operator found that when several revolutions of the



handwheel were necessary, it was hard to manipulate the wrist and arm, especially when the hand had to be stretched across the handwheel. It is of course meant that this wheel was positioned high on the machine as suggested in Fig. 119. The operator had to grip the handle with only the thumb and fingers when near the back stroke. When this handle was replaced with a stud and knob, there was less slippage between hand and handle. Before the knob was finally used, a free-turning handle was tried but with the same finger-slipping results.

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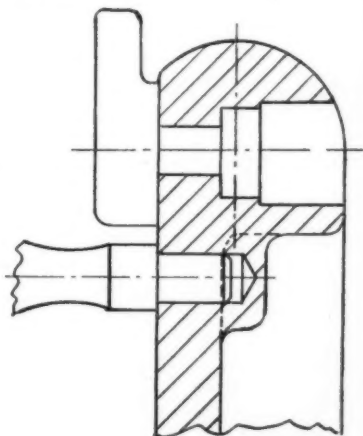
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One manufacturer overcame the objection above by inverting a large handwheel placed high on the machine in the position shown in Fig. 134. It was big enough in diameter to encircle the rest of the mechanism below. Six machine handles were screwed into the rim all pointing downward. It was comparatively easy for the operator to make a partial revolution with one handle and completing it with another handle. Knuckle room had to be kept in mind.

The latter statement also applies to the design in Fig. 135. It was necessary for a large handwheel to swing clear of an obstruction and to have as great a swing at the handles as possible. To keep from disk the rim of the wheel too deeply, the designer decided to place the handles, six in number, opposite the spokes and in line with them also. It was only necessary that knuckle room be observed where the arrowed line is shown.

In Fig. 136 a large handwheel at the end of a screw had to be capable of being turned so that a great deal of pressure was exerted at the end of the screw. Six cylindrical nubbins were cast integrally with the handwheel in line with the spokes. An enlarged view of a nubbin is shown at the right. A rod of rectangular steel as shown in the end view by dot and dash lines is placed between these protrusions to act as a long lever.

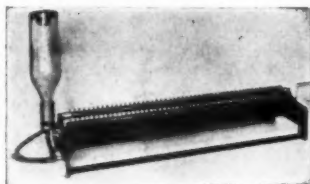


*Fig. 140*

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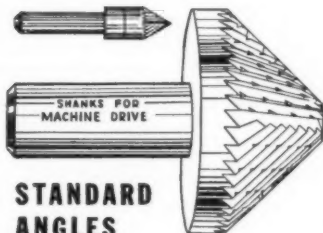
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A novel light weight handwheel of large size was made in the sketch Fig. 137. A disk of steel was suitably bored for the hub of the wheel and six holes drilled into its periphery. Into these holes spherically ended rods were driven as shown. A rod of a trifle larger diameter was rolled into the shape of a hoop and butt welded. This hoop was then welded to the six spokes. Later on, a larger handwheel was required and to further reduce weight, a piece of steel tubing was used for the hoop. It was further suggested that steel tubing could also be used for the spokes by plugging the hole at the outer end before finishing it off spherically.

A rough and clumsy, but still efficient handwheel is shown in Fig. 138. A disk is cast with suitable hub. At the outer surface of the disk are six bosses which are blended into the disk as shown. Holes are drilled in these bosses and reamed for the handles. Long taper pins of large diameter are turned down at the small end to fit the straight reamed holes. The tapered pins are then driven in to the shoulder thus formed. It was suggested to eliminate the extra operation of turning down these pins and reaming tapered holes to accommodate the pins in their natural state and driving them into pre-determined depth holes, thereby bottoming the pins in the holes.

As stated previously in this installment, graduated handwheels are in common use, especially when used to actuate feed screws or gear combinations. A disked type of handwheel with graduations rolled on the outer periphery is illustrated in Fig. 139. The rounded edge of the wheel is turned flat and upon this surface graduated lines are rolled and figures stamped or rolled in. Sometimes the graduations are placed on the front side especially on a rectangular section.

This brings us to another type of handwheel that is used for indexing. No sketch is shown of this wheel. However, it may take several forms. In one design, the handwheel has a large hub with conventional rim, spokes and operating handle. The hub is bored out so as to turn freely upon an internal mechanism, for instance a feed or positioning screw. The hub of the handwheel has a series of reamed holes to accommodate an indexing pin mounted in a flange at the end of the screw. When the index pin is in one of the holes in the hub of the handwheel, the two can be revolved simultaneously. If the operating handle in the rim of the handwheel is not con-



venient to the operator's reach, the pin can be withdrawn and the handle brought around to the desired position when the pin is engaged again.

In another design the indexing holes in the handwheel are reamed in on the front face near the outer periphery. In this instance, the handwheel, minus an operating handle, is made integral with the feed screw. A free turning lever, into which the operating handle is fastened, has an index pin or detent that is spring-backed, similar to that described in the preceding paragraph. The object of positioning the operating handle is the same. In both of these designs, the axis of the screw and handwheel are one and the same.

Still another indexing type of handwheel may be seen on some machines. In this design the auxiliary rotating mechanism is mounted somewhere between the hub and rim of the handwheel and has its own small handle and index wheel. In this type there might be found planetary gearing or possibly an internal gear or two. Differential gearing is operated in the same manner of indexing or positioning.

There is yet another method of posi-

tioning the operating handle of the handwheel for the convenience of the manipulator of the machine. A clutched handwheel can be used. The wheel is free to turn on the screw or other operating shaft. It may be slid on this shaft from one position to another, clutching or de-clutching as desired. Usually a toothed clutch is used.

Stopping the handwheel at predetermined positions involves another feature frequently encountered in machine design. For this purpose, knock-off or positioning dogs are used, adjustably fastened to the handwheel. In Fig. 140, a typical example of dogged handwheel is shown. Either a square hole is cored at the back face of the wheel or a round hole is counterbored to admit the square head of the tee-bolt that fastens the dog or dogs. This hole is put in from the rear so that 360° of dog positioning is available. If this hole were machined in from the front, a dead spot would exist that would be detrimental at times. A tee-slot is then milled in or rather, the part of the slot for the bolt head is milled in, the slot for the shank of the bolt having been previously turned or end milled. The front face of the rim is



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163

flattened sufficiently to accommodate the dog. The operating handle is placed so that the dogs clear it at all times. The dog is held on with tee bolt and hex nut and washer or with tee-nut and fillister or hollow head or socket screw. The handwheel can be so arranged that the tee-slot is machined at the top or outer periphery.

There are times when the mechanism upon which the handwheel is mounted, does not have sufficient room for the company name, emblem or trade mark. Or then again, some notation or direction must be given to facilitate operation of the mechanism. If the handwheel is made so that a flat front face is available, such notations can be placed on the wheel itself. Such is the case in Fig. 141. The front face has two concentric ribs in between on which are cast the name of the company and the product. These letters can be of such a thickness that the top surface does not protrude above the two concentric ribs. Although the operating handle is shown low on the sketch it is in reality in the center midway between the two concentric ribs and at a spot where it does not interfere with the letters. This handwheel is of the disked type.

Small handwheels may take on a shape other than round as can be seen in Fig. 142. This one appeared on a variable speed motor drive manufactured by a well known motor company. It is octagonal in shape and across the two so called spokes is the company name. Regardless of how this wheel is grasped there can be no hand slippage.

In one of the earlier installments of this article, finger grips on handwheels was stressed as an important point in handwheel design. Several other wheels involving this feature have been brought to the writer's attention and are worthwhile being incorporated in this final chapter. In Fig. 143 a comparatively small handwheel is notably notched on its outside periphery. The wheel is finished all over and then notched with an end mill. The short spokes are formed by end milling and when finished gives the wheel a very distinctive appearance.

The handwheel in Fig. 144 is of shell-type construction. The periphery is finished and polished smoothly to be operated with the palm of the hand. When a tightening effect is desired the wheel is gripped with the hand, the

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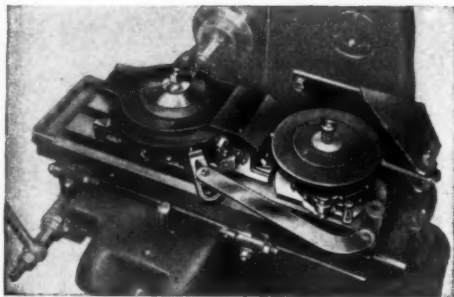
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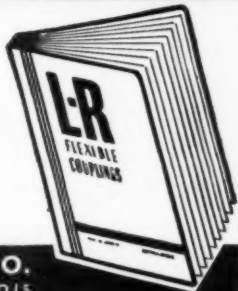
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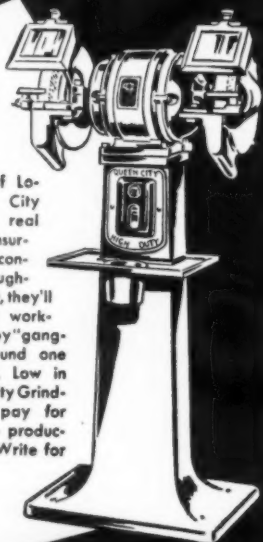


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fingers being placed inside the flange. To avoid slippage, a number of rectangularly shaped protrusions extend inward between which the fingers fit.

In Fig. 145 the rim of the handwheel is serrated with numerous small grooves. The rim is rectangular in cross section as can be seen in the enlarged section, the grooves running across the entire outer face. This wheel is not finished but only buffed to a comparative smoothness and later painted.

The disk-like handwheel in Fig. 146 has a series of rounded or bulb-like projections emerging from either face. The section at the left is taken through the narrow thickness of the flange while the view at the right is looking in towards the center of the wheel from the outside. This wheel is form turned and later polished to blend the bulbs into the flange.

In the six-spoked handwheel portrayed in Fig. 147, a rounded nubbin extends outward from the rim opposite the termination of each spoke. This wheel is buffed off and painted. Some years ago it was common to see spokes of the shape shown, that of a reverse curve. This is hard on the patternmaker and accomplishes nothing relative to appearance or strength of the spoke. In fact the wheel looks weaker than if straight spokes of tapering sides had been used. Such spokes can be seen on old coffee grinders, sewing machines, valves or other forms of antiquated machinery. Occasionally one may be seen on a machine of modern vintage but it is a safe bet that the designer dug down to the bottom of the pattern storage for such a relic.

There are occasions when a handwheel must be removable from a shaft, especially when it is used infrequently. In Fig. 148 the hub of such a wheel is shown. The hole is spline-broached and has a suitable spring backed detent pin to hold it laterally in position. No screw or nut and washer is necessary to retain the wheel on the shaft.

Position of the operating handle on the handwheel has also been referred to in a former installment. Usually almost without exception, handwheels equipped with a handle parallel to the axis, have the handle entering the center of the rim or in close proximity thereto. However, there are times when the wheel is large that it is undesirable to swing such a large circle when the handwheel is rotated one or more revolutions. The sketch in Fig. 149 shows how one de-

signer took care of this feature. He drilled and tapped four holes along the built-up spoke for the various positions of the handle. In another design not shown, a free-turning handle was placed on a spoke only one-third the distance out from the hub. It is odd-looking, but when one considers that the torque is of inconsequential magnitude it can be seen readily that a large swing of the arm is unnecessary. Grasping the rim of a large wheel provides close and accurate setting when the handwheel is mounted on a screw.

In still another design the handle was attached to a lug extending inwards from the rim, midway between two spokes so that the handle was about  $1\frac{1}{2}$ " inside the center of the rim. One handwheel having a very large hub and six rather short spokes has the handle mounted in the hub, near the junction of a spoke and the hub. However, there was plenty of finger room between the hub and rim but the rim was free of any protruding handle. To go to the other extreme, one handwheel observed with three radial handles had an operating handle parallel to the axis of the wheel mounted on a stud, the latter being screwed into the rim of the handwheel.

In this instance, the handle for rotating the wheel was out from the rim a good three inches. The handle was at right angles to the stud.

In the last three sketches, are unusual spoke effects. In Fig. 150 a round opening between the hub and the rim formed the basis for a branching spoke. The smaller opening between two adjacent circular openings added more finger room. This handwheel was quite large so that the smaller opening more than accommodated four fingers without pinching.

A modernistic type of handwheel is illustrated in Fig. 151. Three wide spokes as shown in the view at the right are curved inwards between the rim and hub more for appearance than for utility. The outside of the rim is form finished halfway around. Finger room between hub and rim was too small so that the flanged hub had to be reduced in diameter. The edges of the ribs were rounded off with a generous radius.

In Fig. 152 the six spokes were formed with one sweeping radius per opening in the flange between hub and rim. The radius was such as to give a pleasing taper to the spokes. The radii used where the spokes join the rim are large enough to conveniently fit a finger.

This concludes the series of four installations of handwheel design. The writer feels that most salient features of handwheel construction have been suitably covered but is also cognizant of the fact that many other unusual shapes exist for many unusual installations. THE END.

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## USING A COMPANY PICNIC TO PROMOTE

# *Better Management-Labor Relations*

by C. M. Feeney

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A company outing is an entry on the credit side of the labor relations ledger. When Joe from the Machine Shop sees executive Jones hit a 2-bagger and get excited, this is something Joe can understand. Mr. Jones, likewise, gets acquainted with the help on an extra-curricular level. Some ideas for company outings are presented in this article.

**"A**RE THOSE a few clouds up there?"  
"I got a birdie on that one!"

"Joe, have you got Junior with you?"

"Strr-ike Three! Yer O-O-O-U-U-U-T-T-T! The Boiler House gets the cup!"

These are sounds reminiscent of a certain kind of entertainment—an outing, and more specifically—an employe outing. The first is probably uttered by a committee member, the second by a crowing golfer, the third by an anxious mama after Junior has completely disappeared, only to turn up avidly watching the ballplayers, where he hears, but may not comprehend the fourth statement.

Friendly rivalry is the keynote. Management and labor meet each other on the same ground. Here, the second helper on the labor gang may play a better game of golf than the second vice president and be congratulated in front of all the "brass hats" for his prowess. The vice president's wife may win the contest for calling her husband in a louder voice than Mayme, the janitor's wife.

Such gatherings pave the way to strong bonds between company and employe, and between employe and employe. When Jack Smith who works on the

bench and Sam Jones, the second vice president, play softball together or compete in a male-leg beauty contest, their relationship and attitudes toward each other will ripen into a more understanding exchange. The second helper and the laborer can take management off the mental pedestals on which they had them enthroned, because they have seen management out from his desk and the plant and met him on even grounds.

The J. P. Seeburg Corporation of Chicago, is an organization which believes in encouraging employee recreation plans. These plans generally stem from their Employees Association, an organization composed of employees who pay dues and have at least 30 days' service with the Company.

Mr. Ralph M. Isacksen, personnel director, says, "At no time can we expect or even hope that our social and recreation program can entirely calm the sea of personnel relations in industry today. It can be an aid or partnership to this end, and management to-

day realizes the importance of good planned recreation."

For news of what other companies are doing in recreation and for ideas and innovations that can be incorporated into their program, the Seeburg Corporation relies upon the bulletins and services of the national Industrial Recreation Association, of which they are members.

The Association operates exclusively in industrial recreation. It keeps members posted on all developments in employee recreation, and makes it possible for them to share ideas. To carry out these policies and to provide services, the IRA has a national headquarters at 185 N. Wabash Avenue, Chicago, with a full-time administrative staff. From headquarters come a series of services such as their Newsletter, Idea Clinic, Sport-Folders for Employees, etc.

In its well planned booklet, "Employee Picnics," the Association makes excellent suggestions for company picnics, applying to large and small organizations alike. The combined picnic

• • •

**Final play-offs of the plant softball league may provide a fitting attraction for a picnic. The program committee must make an effort to please everyone expected to come and include special games and events other than the main one.**





experience of member companies is the basis for the material presented. Everything from the choice of a spot to the work of the clean-up committee is covered.

After the picnic bug has bitten, IRA recommends that a committee be formed. There may be one or many committees chosen, depending on the size of the organization. A small organization will coordinate several activities under one head. Larger companies will allocate one job to each committee. A nucleus suggested in "Employee Picnics" is finance, purchasing, facilities, program and publicity committees. Under each one of these, various subdivisions exist, as budget, tickets, insurance, etc., under finance.

The Seeburg Corporation follows IRA's suggestion. A committee is the first thing formed and it sees that the particular activity planned is publicized and promoted to the complete satisfaction of all.

One of the very important commit-

tees is the promotion and publicity committee. The members of this committee insure attendance of employees at the picnic. Their tools are the employee magazine, posters on bulletin boards, handbills and bulletins, etc. Seeburg employees read their news in "The Seeburg Voice," a house organ edited and compiled entirely by employees. In addition, a weekly sheet, called the "SWAN," is posted on all bulletin boards, giving the latest facts and stories concerning sports results and coming events. Posters and displays are also helpful and are used in conjunction with aforementioned publicity sources.

An added means of publicity here are the facilities of their public address system. Private telephone lines connect each plant directly to the broadcast studio. Important announcements all emanate from this studio.

Where to go is often the most debated question. The choice of a site depends upon the preferences of the employees.

• • •

At a company outing, entertainment for children should not be forgotten. A special favor for each child pleases the parents and delights the children. There is a wide variety of children's games from which to choose, like special obstacle races, Tug-of-War, balloon relay, etc.







Golf outings provide excellent get-togethers. The Seeburg Corporation holds regular golf tournaments with a play-off at the end of the season. The Social and Athletic Association, composed of employees, generally sponsors activities, with the exception of the Annual Picnic and the Christmas Party, which the Company sponsors.

Some prefer to commune with nature and meander along the banks of a stream. Others like gaiety and life—for them commercial spots like amusement parks, improved beaches, highway dance pavilions, picnic groves and country clubs are ideal.

When to hold a picnic depends upon company policy, where the picnic is to be held and the recreation calendar. The management may have certain months when the plant runs at full capacity and a day off for employee celebration is out of the question. Later on, the work may be a little slack and a day off is not so vital a consideration to the management. The week-end is the best time for a picnic in a non-commercial spot. If final play-offs of the plant softball league are the primary consideration, the important thing would be first of all to find a good softball field. Size of attendance expected, of course, is a big consideration.

Picnics are financed either by the picnicers who pay for everything or the company may finance it, as in the case of the Seeburg Company, who finances the big picnic held in the summer.

Not to be overlooked is the safety committee, of which the plant safety director should have charge. This committee looks into the general safety of the site selected for the picnic, the sanitary facilities, water facilities, cleanliness, location of the parking lot so that the cars will not drive through the picnicers, etc.

All the planning and preparation will be to no avail, however, if employees cannot reach the picnic grounds. Transportation must be provided for those employees who are without the means of getting to the site. If public conveyances do not run out, rides in private cars or private buses should be arranged.

After the crowd has arrived, they expect to be entertained. Games and events are always popular. But they must be kept on a schedule and move right along. Otherwise, boredom ensues if people have to sit around waiting to find out who won the last prize or wait for each contestant to get signed up for the events. A program with variety will appeal to a crowd. Possible events listed in "Employee Picnics" are obstacle races like the three-legged

Specific interests of the picnickers should govern the choice of the picnic site. Sports lovers enjoy a place where facilities are available for their favorite recreation. Local weather is a factor to be reckoned with also. In Northern U. S., summer and early fall are popular.



race, the wheel-barrow race, the egg race in which the contestant runs along balancing an egg on a spoon; the male-leg beauty contest, the dance contest, the shoe scramble, the greased watermelon, funny hat contest, etc.

All the entertainment in the world, however, cannot overcome the pangs of an empty stomach. Picnickers are al-

ways ready to eat. The elaborateness of the menu depends on the finances. The entree may range from a weiner roast to grilled steaks, but there should be plenty to eat. Potato salad or potato chips, pickles, olives, soft drinks, coffee, desserts, fruit and ice cream are standard equipment. The company cafeteria or an outside caterer may

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prepare the food. When the picnic is to be held in an amusement park, the park operator may contract to feed the crowd, or furnish only part of the refreshments. Where the food is free, second and third helpings must be governed; a good way to do this is through the use of coupons. In this case, each picnicker is handed his coupons in advance and he uses them as desired.

When the park has been littered with paper, and the last frankfurter eaten, the picnic is usually declared over. But that is when the clean-up committee takes over. Its main job is to return props and survey property for possible damage where the company might be held liable.

And so the outing is over. John, Joe and Mary prepare to go home. The last

car whirrs out of the lot. The lights go out, and all is quiet. But the next working day when Joe sees Mr. Jones, he says, "Good morning," to him with a smile in his voice. In an aside to his fellow worker, "Did you see old Jonesy bat that ball? He nearly threw himself out of commission, but he hit it!" The groundwork for smoother employee relations has been laid. THE END.



## NEW TYPE END MILL

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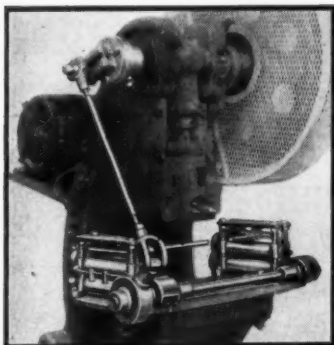
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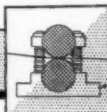
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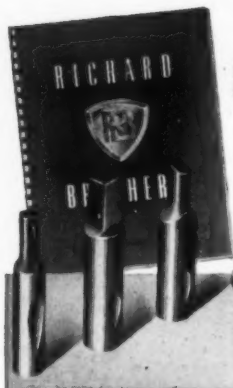
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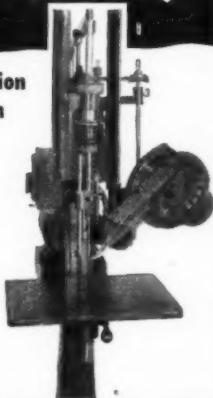


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# Letter from England



Written for the **MACHINE** and **TOOL BLUE BOOK** by Robert Hutcheson, Editor of **MACHINE SHOP MAGAZINE**, London, England.



A giant crankshaft has been forged by Walter Somers Ltd., Hales Owen, for the diesel engine of a cargo vessel of about 8,750 tons dead weight. This crankshaft is for a four-cylinder N.E.M.—Doxford opposed pistons engine which will develop 5,000 b.h.p., and is built up of nineteen pieces (besides coupling bolts and nuts) shrunk together without dowels and keys. The shaft has a finished weight of 55 tons and an overall length of 40 ft. 6 ins. The journals and pins are 20 ins. diameter.

All diameters have a tolerance of  $\pm 0.004$  in., and are truly circular to 0.0015 in.

The shaft was built up from one 60-ton ingot, one 50-ton ingot, two 40-ton ingots and some smaller ingots—giving a total weight of about 220 tons of ingot steel.

In spite of our need to obtain a closer balance between imports and exports, our imports continue to rise. During April our imports were £8,000,000 higher than those for March and reached the figure of £186,200,000. This was nearly three million pounds higher than the country's pre-war record month for imports which was January 1920. Machinery imports for April were nearly one million pounds more than those for March. April exports amounted to £126,400,000 an increase of £5,400,000 over the March figure.

Discussions have been started with Danish agricultural organisations on the im-

port of British tractors now that Danes can use tax-free petrol for agricultural purposes. Harry Ferguson Ltd., are reported to be able to supply the Danes with 2,000 petrol tractors this year. 4,000,000 kroner have been allocated for the purchase of British tractors but agriculturists in Denmark are asking for an increase in this sum.

It was of interest to note several new agricultural tractors at the British Industries Fair which closed ten days ago, and one of these was a one horse power pedestrian-controlled tractor for use on small holdings, etc. It had a number of attachments and could be used for ploughing, hoeing, ridging, grass cutting, hedge trimming and as a small truck or barrow.

Heavy demands are being made on the north-west works for iron and steel, and although record outputs of hematite pig iron are being obtained the demand continues to be greater than the supply.

Steel output over the whole country is increasing but it has not yet reacted on those engineering works that are big users of steel. It takes time for the extra steel to find its way into the machine shops and although there is an increase in output this increase will by no means look after all the demands for steel.

While the members of the steel industry are opposed to nationalisation of the steel

industry with its ramifications and complications, there are also several trade unionists and Labour members of parliament who are opposed to it. There has been a certain amount of unrest about the way in which other already-nationalised industries are being run, and many of Labour's own supporters are criticising the nationalised industries, all of which seem to be spending money, putting up prices and showing a negative profit.

The Control of Engagement Order, which was introduced last October, is having its effect on the way in which man-power is being allocated to the essential industries. The engineering industry is not having its manpower stepped up; this is in accordance with Government policy stated over twelve months ago when Sir Godfrey Ince of the Ministry of Labour said that the engineering industry must make a very substantial contribution to our exports but that it was considered that the industry was well off for manpower compared with other essential trades. During March 3,000 new workers entered agriculture and 2,000

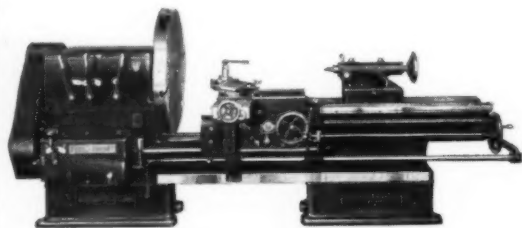
entered the textile trades. Coal mining managed to obtain 700 new employees.

A few days ago Britain's lead in the world of science received its acknowledgement in France when the French Minister of Education, M. Depreux, opened an exhibition in Paris which was dedicated to the work of Humphrey Davy and Michael Faraday. Several pieces of equipment which were used by these scientists have been lent by the British Museum and the Royal Institution. One of Davy's greatest contributions to mankind was the miner's safety lamp which enabled a flame to be used with safety in a coal mine, while to Faraday we owe the electric motor and dynamo.

The mission that was sent by the Ministry of Fuel and Power to study German methods of obtaining petrol from coal, reports that to do so by the Fischer process or by hydrogenation would not be economical. Petrol suitable for motor car use was obtained from brown coal, which could be obtained cheaply, at the Leuna

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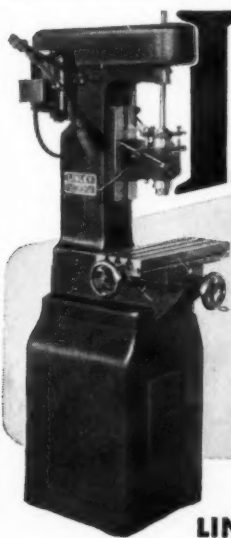
works and there the cost was over one shilling per gallon at the pre-war rate of exchange; this figure did not include any profit margin. During the war years Germany obtained a considerable part of its petrol by hydrogenation, but at that time cost was not taken into account.

Coal output in Britain varies from week to week. The week ending 1st. May saw an output of 4,223,600 tons, the following week's output was 4,120,500 tons and the next week showed a yield of 4,177,900 tons.

On the 17th May a new Royal Air Force trainer 'plane fitted with a gas turbine made its first flight. Details of its performance have not been disclosed. The machine is the Boulton Paul Balliol and is the first British trainer to be equipped with a gas turbine jet unit driving a propeller. Accommodation for passengers as well as for the instructor and pupil is provided, and a new type of windscreen is fitted by which it is possible to simulate night-flying conditions while the aircraft is in flight.

Paint is used as a finish in many branches of industry and a scheme for increasing export of this commodity has been worked out by the paint manufacturers. One hundred and fifty paint firms will increase overseas sales of their products by a co-operative scheme which involves co-operative marketing and the use of standard formulae, standard colours and standard packaging. Participating firms will be sectioned so that certain firms will make certain qualities and colours for the entire group, and paint will be sold abroad by the group rather than by the individual companies who will sink their individualities.

Magnesium dockboards weighing only a fraction as much as corresponding sizes in steel are being manufactured by Magline, Inc., Pinconning, Mich. These can be moved and placed by fewer workmen and with greatly increased worker safety.



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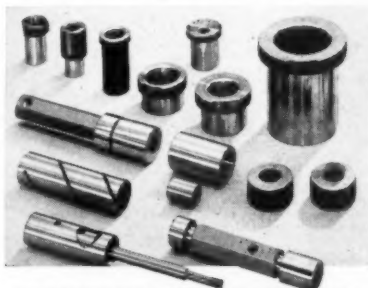
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# THE FOREMANSHIP FORUM

By Edmund Mottershead

## WHAT MAKES A GOOD PERSONNEL DIRECTOR?

From a practical standpoint, personnel men have been hired by industry largely from two sources: from without the organization as a "personnel man", and from within the organization by promotion. The history of many personnel directors is simply that of being a member of an organization in which the personnel management function was growing, and gradually taking over the work. Sometimes the hiring was done by the plant superintendent or department foreman. Much of this work was delegated to a clerk who conducted preliminary interviews and perhaps sent the men down to a specific department for a job (placement). Gradually this "clerk" got to be more and more important and did more work until a separate department was set up.

The other story is usually the case of an organization in which payroll functions were handled in the accounting or billing department and hiring done hit or miss by the various department heads. All at once the front office decided to set up a separate personnel department; so they stepped out and hired the nearest likely looking individual outside the organization for the job. In some cases this was really done to provide department heads and top management a place to toss all the hot potatoes they had been tossing around amongst themselves; in other cases a real personnel function developed.

Before going further, just what is the personnel function? Depending upon local practices and the production methods and conditions in the organization, the personnel function may be any one of three things, or may include any or all of them: 1. Procurement; 2. Collective bargaining; 3. Management engineering.

The procurement function includes hiring, selection of workers, the use of tests, either trade tests or psychological tests, orientation of workers, training and placement of workers. Considerable technical shop knowledge is required for trade testing, interviewing and placement; a good deal of basic teaching technique is required to set up and handle personnel training as a whole; employee orientation is an inside public relations job; and psychological testing is again a highly technical proposition.

The collective bargaining function, union relations, labor relations, labor-management committee handling, call it what you will, is familiar in industry but not always conducted in the personnel department itself. Frequently this is carried out in the public relations department, or directly by top management; but in any case the technical knowledge of labor legislation and bargaining practices requires considerable study and experience before turning the man loose in a bargaining conference.

The so-called management engineering function includes such personnel management matters as wage systems, bonus and incentive plans, job evaluation, disciplinary practices, discharge and separations practices, morale programs, safety or health programs, grievance procedures, suggestion systems, promotions and transfers. A high degree of technical skill is required in almost every phase of this activity . . . just ask any management engineer.

There is one other aspect of the personnel director's job which cannot be classified as "technical" skill . . . the human relations element. Joe comes in the office and asks to borrow ten dollars until next payday please. He leaves and Sadie comes in with her usual complaint about the girl she works next to. The personnel director has a new idea for a training program and the foremen all say they are too busy and anyway they don't like it. Such people. The ability to deal with people, to make them respond as desired because they think they want to, is the single element which cannot be classified, which appears in the successful personnel director regardless of his previous background. And it is because of this factor along with at least the ability to handle one of the three technical phases of the personnel job, that many personnel directors have got their jobs.

It is difficult to put your finger on the button and say "This is why so-and-so is successful." The man across the street has different conditions and succeeds for an entirely different reason. However, some light may be shed on the subject by looking over the personnel directors who are successful. The International Research Foundation for Personnel Administration conducted a program to set standards of proficiency and personnel qualifications for personnel work. In connection with this

activity, the Registered Personnel Administrator came into being as the personnel director who passes certain standards, who has certain basic qualifications, and whose activity gives evidence that his personnel administration is successful.

The personnel backgrounds of the first 500 personnel directors to apply for registration were examined and the results tabulated on charts. In a preliminary survey such as this, not all the information which might be desired was obtained, but there is enough evidence to show trends at least. Seven factors are indicated: age, size of company (or job), length of time in personnel work, length of time as head of personnel function, formal educational background, collateral educational background, and the collateral education taken by personnel directors scattered over the country.

It appears from these tabulations that the typical personnel director at the present time falls into the 36 to 43 age group. (It should be stated that among other qualifications on the preliminary registration, all were required to have at least 2 years' experience in personnel work, which eliminates the less experienced and less able from the figures in the survey.) While only 4% of the men studied had less than 2 years' experience as head of a personnel department, 70.2% of all men covered had no more than five years' experience. 24.7% had from 6 to 10 years' experience, and roughly 5% had more than ten years as head of a department of personnel.

At the same time, men who had less than 6 years' total personnel experience were only 39% of the group; 52% had from 6 to 10 years of experience and 9% had more than ten years in personnel work. This simply means that the importance of the personnel

function has expanded greatly in recent years, and that as specialized techniques are developing there is an increasing move toward establishing separate departments for the purpose.

Most of the personnel directors appear to be mature individuals. 43% are between 30 and 40 years of age; 41% between 40 and 50, 10% older. Only 6% are less than 30 years old, the youngest being 23 (The only one under 27 in the 500 cases covered). 61% of the personnel directors worked in plants with less than 1,000 people; though only 5.5% were in organizations with less than 200 persons employed. Only 11% were in organizations with over 2500 people. The largest single organization reported 21,000 on the payroll under one personnel manager.

The educational factor appears to be possibly the most significant factor in the group. 21% of the men reported 2 or 3 years of college; 46% were college graduates or better (including 17 with M.A. or Ph.D. degrees). This is a total of 67% exposed to college for 2 years or more. Only 38 men reported less than high school, and only 21 reported as high school graduates only. The important element under the surface here is that with relatively few exceptions, the older men, with the most years of experience, usually in the largest organizations strangely enough, were the men who reported little or no college training. The younger men, more recently in the field, are almost universally college graduates.

The second fact beneath the surface of this that with 84% of the men between 30 and 50, with the typical age being between 36 and 43, college graduate or not, the average personnel director had little or no formal training as such. Primarily for the simple reason that few colleges were offering courses in personnel administration ten

years or even five years ago. In fact, few indeed are offering such training today. This resulted in an otherwise incredible enrollment in collateral courses, adult education programs, home study courses, and the like.

The 500 men who reported collectively took a total of 1,614 such courses in the last three or four years, an average of 3.23 per man. For the most part this was done at his own expense on his own time. 21 men did not report their additional training. One man reported having taken 19 such courses. Perhaps he is serious-minded. In all, some 32 subjects were listed. Of these, 23 apply directly to the personnel functions. The leaders: business management, foremanship-supervision, industrial relations, personnel administration, and public speaking.

Further research on the subject is continuing by the Foundation, but the above facts at least indicate a trend. The successful personnel man is:

1. A mature individual
2. Skilled in human relations
3. Probably college trained plus extra special courses
4. Skilled in at least one of the three aspects of personnel work:
  - a. Collective bargaining
  - b. Procurement
  - c. Management engineering.

And if he will continue to be successful, he will in all probability have at least two if not all three of the last named skills.

---

Link-Belt Co. announces that **C. C. Wiley**, heretofore district sales manager at Birmingham, has been appointed district sales manager at Baltimore, to succeed **H. Merrill Bowman**, new asst. divisional sales manager for power transmission, with headquarters in Chicago. Announcement is also made of the appointment of **James T. Bell** as district sales manager at Birmingham to succeed Wiley.

# Shop Hints

## NEW CUTTING PROCESS PERMITS IMPROVED GEAR DESIGN

An improved gear design without undercut on the flanks (as would be obtained with gears generated by conventional shaping) has been obtained by Barlow & Seelig Mfg. Co. of Ripon, Wisconsin as the result of its use of the Shear-Speed gear cutting process.

The gears in question are the double end drive gears for the wringer of the company's "Speed-Queen" washing machines (shown in foreground of photo). The teeth of these gears mesh with cup shaped crown gears to drive the wringer in either direction, speed of the pinions being 320 rpm.

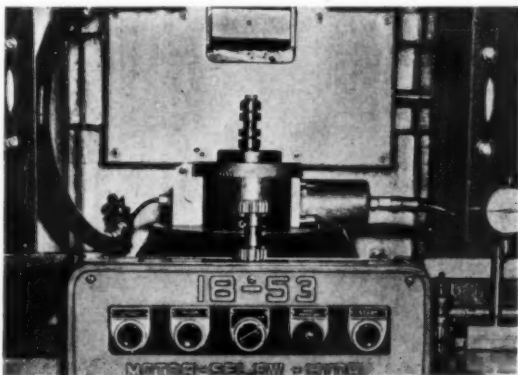
As the result of increased demand for its machines, Barlow & Seelig secured a Shear-Speed machine from Michigan Tool Company, to step up its production. This single new machine (which cuts all teeth of a gear simultaneously with radially fed form tools) takes care

of the company's increase in output by producing some 120 gears per hour (60 double ended pinions).

In addition, since the Shear-Speed "forms" rather than "generates" the gear teeth, it was found possible to make the gear teeth with straight flanks below the pitch circle, increasing gear strength and improving quietness in operation.

The gears are 10 pitch, ten tooth. To cut the opposite end, the pinion is merely inverted in the work holding fixture. Clamping is automatic. Desired tolerances of plus or minus .0015 in. on pitch diameter and .003 on concentricity are easily held with this setup. Material of the pinion is B1113 cold finished steel bar stock. Teeth are rounded after cutting and the pinion is then cyanide hardened.

• • •  
Closeup of the Michigan Shear-Speed with the driving clutch member blank mounted on the hydraulic fixture, and the same part with the ten pitch ten tooth gears, cut in less than 30 seconds on each end, on the ledge in the foreground.



## HANDLING OF ODD SHAPED MACHINE PARTS MADE EASIER

Here is a solution applied by one methods engineer to a materials handling problem involving crankshafts—a solution which might well be applied to the handling of other odd shaped machine parts.

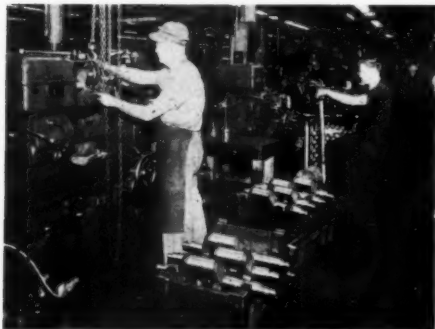
By cutting notches in the sides of skid bins, four crankshafts could be transported to and from machine locations on a single hand truck. The notches hold the shafts in place and prevent them from rolling and striking one

another while in transit. Use of deep skid-bins accommodates the odd shape of the crankshaft. This factor plus offset projecting corner-reinforcement angles, make it possible to nest the skid-bins, one on the other, for more efficient use of temporary storage space. Nesting of bins four and five deep without danger of toppling or side-slipping was made possible. By using skid-bins of this type the number of damaged crankshafts was reduced, and materials were moved more rapidly from one operation to the other.

Through the use of the handling system illustrated, the "float" at each machine is kept to a minimum; that is, the supply of material temporarily stored at each machine location is kept small. The operator works out of one bin, and as he finishes the material in that bin, the boy takes it away by means of the Yale hand truck, and returns with another bin of material to be processed.

Another interesting feature of this production operation is the handy clamp which the operator slips around the crankshaft and over the hook of the chain hoist whenever he moves to work to or from the machine.

Ideas such as: (1) notching the sides of the skid bins, (2) use of deep bins to accomplish stacking one crankshaft load on the other, (3) off-setting and projecting the corner-reinforcing angles to permit nesting of the bins, (4) employing spacers for tiering loose castings, (5) using the clamp for work set-ups, and (6) utilizing hand truck transportation to save handling, can be used effectively in many other cases where loads are both heavy and fragile—loads of cores, cement blocks, green brick, glass, pottery, explosives, etc. For handling loads such as these, the Yale "Spring Frame" model truck used here is especially helpful as it is designed to prevent jars and shocks from being transmitted to the load.



### EX-PRESIDENT OF L. S. STARRETT CO. DIES

David Findlay, former President of The L. S. Starrett Company, Athol, Mass., died on April 3, 1948. He was actively associated with his company for fifty-five years. He started on the road in 1891 assisting the founder, Laroy S. Starrett, in pioneering Starrett Tools with both the trade and the shops. At the turn of the century he was appointed general sales manager and in logical consequence of his outstanding ability he became a director, vice president and eventually president of his company. A genial and forthright gentleman of the old school, Mr. Findlay will be long and affectionately remembered by the tool industry.

Mr. Findlay retired early in 1946, being succeeded by the present president of the company, Arthur H. Starr-ett.

### **SIMULTANEOUS INTERNAL AND EXTERNAL THREADING**

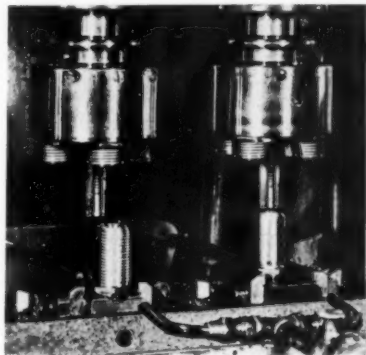
Simultaneous internal and external threading of large steel bushings is another neat way of combining operations to increase productivity. Developed by an automotive parts plant, this idea is used in producing some 1100 threaded parts per hour for shock absorbers, knee action assemblies, etc., on a 10 spindle Allen multiple drill press.

Shown in the close-up are two bushings, one before and one after threading. The internal thread is machined with a tap having a pilot to assure correct alignment, while the external threads are cut with thread chasers which revolve with the spindle. The tap is held in the die head by means of opposing lock screws.

Material being threaded is cold rolled SAE 1111, the bushings ranging in size from 1 1/8 to 1 1/2 inch OD. Both external and internal threads are all 11 pitch. Internal threads range from 11/16 inch to 7/8 inch nominal size. Bushings are

from 1 1/2 to 3 inches in length.

The taps are made by Detroit Tap and Tool Company, of its M-11 chrome-



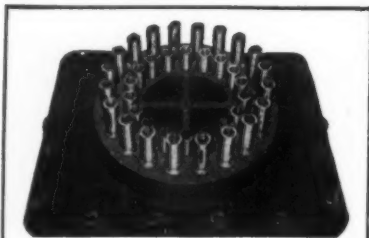
cobalt HSS. In operation the bushings are slid into the fixture, hex end down. Thrust of tap holds the parts down and torque is taken on the hex. The fixture is cleared of chips by an air jet in front of each fixture. Roll curtains attached to each dual spindle head and traveling up and down with the ram protect the operator from oil spray.

### **MARSHALL STEEL APPOINTS TRI-STATE**

The Marshall Steel Co. has appointed Tri-State Products Co., Toledo, as exclusive distributors of Marshall Steel flat stock in the Toledo area. Tri-State Products distribute a line of machine tools, cutting tools and general industrial supplies.

### **LINDBERG ACQUIRES ELECTRONICS DIVISION**

Lindberg Engineering Co., 2444 West Hubbard St., Chicago, manufacturers of industrial heat treating and melting furnaces, has acquired the assets of the Electronics Division of Illinois Tool Works, Chicago, and will continue the business of the manufacture and sale of high frequency induction and dielectric heating equipment, according to an announcement made by C. H. Stevenson, Lindberg vice president.



*Pictured: a 38-Spindle Heavy-Duty Drill Head.*

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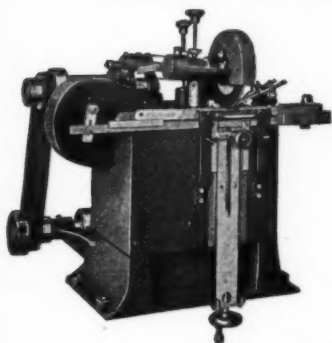
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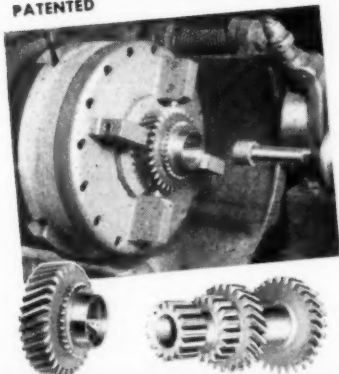
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# **EUROPE'S LARGEST MULTI-DAYLIGHT PRESS FOR LAMINATED MATERIAL PRODUCTION INSTALLED BY FORMICA LICENSEE IN ENGLAND**

Europe's largest multi-daylight press for producing decorative and industrial laminated material and involving a number of novel features has been installed and is now in operation in the new Tynemouth England plant of DeLaRue Insulation, Limited, British licensees for producing decorative laminates of The Formica Insulation Co., Cincinnati, Ohio.

D. J. O'Connor, president of The Formica Insulation Company, Cincinnati which licenses DeLaRue for production and sale of Formica decorative laminates in Great Britain, Europe, Africa and Asia, with the Western Hemisphere alone excluded, has been notified by DeLaRue management that the press weighs about 200 tons and exerts a pressure of 5000 tons.

The press which is disclosed as the largest in Europe is built up in four sections with two rams in each section. These rams, each 18 inches in diameter have five foot strokes and develop a maximum pressure of 2½ tons. The cast-steel cylinders and bases each weigh 12¾ tons.

On each side of the press stands a pre-loader weighing another 35 tons. When one charge is in the press, the previous charge of finished sheets is being unloaded from the pre-loader at the same time as a new charge of unpressed sheets is being loaded in, thus conserving press time.

The entire cycle of operation is controlled by push-button technique enabling a single operator to supervise the complete unit.

Jo Eerdmans, managing director of DeLaRue Insulation visited the Formica factory in Cincinnati for a conference with the Formica executives enroute from a business trip in South America and back to England.



# ANNOUNCES A. F. DAVIS WELDING AWARD PROGRAM

To stimulate undergraduate interest in welding, funds have been donated to the American Welding Society for the A. F. Davis Undergraduate Welding Award. This award consists of four cash prizes given annually to authors and publications for the best and second best articles on welding published in undergraduate magazines or papers during the preceding year. Any undergraduate of a college or university in the United States or Canada is eligible, but the paper must be published in an undergraduate publication.

The A. F. Davis Undergraduate Welding Award is named for its donor, A. F. Davis, vice-president and secretary of the Lincoln Electric Company, Cleveland, Ohio.

The awards will be \$200.00 to the author of the best paper; \$200.00 to the publication; \$150.00 to the author of the second best paper; \$150.00 to the publication.

A suitable certificate will be given to each author and publication receiving awards. In case of joint authorship, the author award shall be given jointly; however, certificates will be issued to each author.

Subject matter of the paper may be on any phase of any type of welding or its application to design and construction.

Any undergraduate of any college or university, in the United States, its possessions, or Canada, is eligible. The paper must be published in an undergraduate publication in the interval between April 1, 1948 and April 1, 1949. Six copies of the publication must be received at the office of the American Welding Society, 33 West 39th St., N. Y. 18, N. Y., before 5 P.M., April 10, 1949, marked to the attention of the chairman of the Educational Committee.

The judging shall be based on originality of subject, originality and clarity of presentation and the thoroughness with which the subject is presented. The decision of the judges will be final.



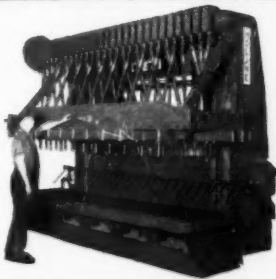
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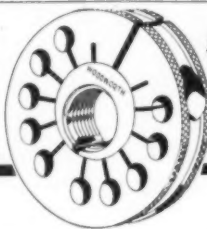
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## DEEP DRAWING ALUMINUM

Usual definition of deep drawing is production of a drawn shape whose depth is appreciably greater than its diameter, such as a cup shape 20 inches deep and 10 inches in diameter.

Many aluminum alloys can be deep drawn easily because of their excellent workability, being equal to that of copper, brass and deep drawing steels. While single action mechanical presses are satisfactory for drawing small parts, double-action mechanical or hydraulic presses are preferred for deep drawing work because of the much better control of blank-holding pressures they permit. Adjusting the outer ram easily provides the precise setting of the vital hold-down pressure. In addition, modern hydraulic double-action presses have speed controls which permit still more satisfactory control of the drawing operation.

Selection of press equipment is further determined by drawing pressures.

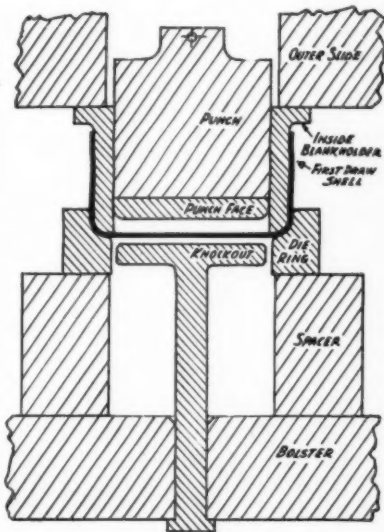
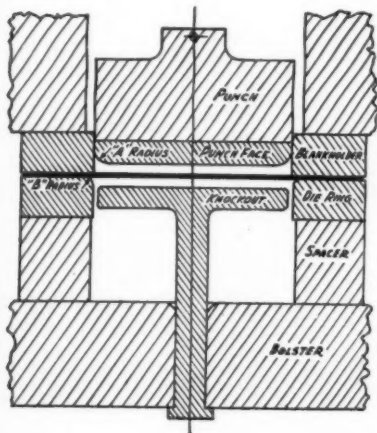
One method of calculating drawing pressures for hydraulic presses assumes that they are approximately equal to the blanking pressures. These are determined in a number of ways. Actual shear load can be calculated from the cross section area of the part and shear stress of the metal. For mechanical presses, the shear load is multiplied by a factor (2-2.5) to obtain drawing pressure.

For example, assume a cup 6 inches in diameter, 5 inches high, 0.064-inch wall is to be drawn in 3S-O. The 18.85-inch circumference takes 6.635 or 7 tons shearing pressure for the ram on a hydraulic press.

For a mechanical press, use of the factor of 2.5 gives 16.5 tons required on inner ram. Blank-holding pressure is usually figured at one-third draw pressure.

This estimation of pressure does not include extra pressures required for

Below, typical first operation draw tool. Extreme right, typical tooling for second and subsequent draws reducing cup diameter, increasing depth.



ironing or to overcome wall friction. And for certain irregular shaped parts, pressure up to 50 per cent more may be required.

Design of deep drawn parts should be aimed at eliminating all frills, embosses, offsets, ridges, beads, etc. not absolutely necessary. Anything other than a smooth uninterrupted surface adds to the cost.

Now to calculate number of draw operations, starting blank size must be known. Since actual surface area of a blank changes little during drawing, blank size can be calculated by figuring the area of the drawn part. A common error is to compute blank area from lineal dimensions of the finished part instead of area of the finished part. At the same time, a safe allowance should be made to overcome loss of metal through possible "easing" and to provide sufficient metal for trimming. This allowance should be determined from the number of draws.

The number of drawing stages or reductions for aluminum stock  $\frac{1}{8}$ -inch or thicker equals the blank diameter divided by diameter of the finished part. For material under  $\frac{1}{8}$ -inch thickness, add another operation. In either case, if the result comes out .5 or larger fraction, an extra operation must be figured.

Amount of reduction per draw for material  $\frac{1}{8}$ -inch and thicker is calculated in this manner: Diameter after first draw equals blank diameter times 0.55-0.58; each subsequent draw is then 0.72-0.85 times previous draw diameter.

At the Annual Meeting of the E. W. Bliss Co., Detroit, all members of the Board of Directors were re-elected for the ensuing year. Also elected to membership on the Board, was **D. Lyle Fife** of Detroit and president of the Fife Electric Supply Co., the Detroit Football Co.

**Webster B. Todd** was recently appointed to the Executive Committee of American Wheelabrator & Equipment Corp., Mishawaka, Indiana. Mr. Todd is also a member of the board of directors.

For material under  $\frac{1}{8}$ -inch, diameter after first draw is 0.58-0.60 of blank diameter; after subsequent draws, it is 0.78-0.85 times previous draw diameter.

It is always good practice to establish first and intermediate draws at even fractional sizes wherever possible. This promotes using tooling to the best advantage. Here is an example:

Assume we have the cup first mentioned, 20 inches deep inside, 10 inches inside diameter, beaded around top edge, 0.064-inch thick. Total area is 773 square inches, giving a blank  $31\frac{3}{8}$  inches in diameter, with no allowance for earring and trimming.

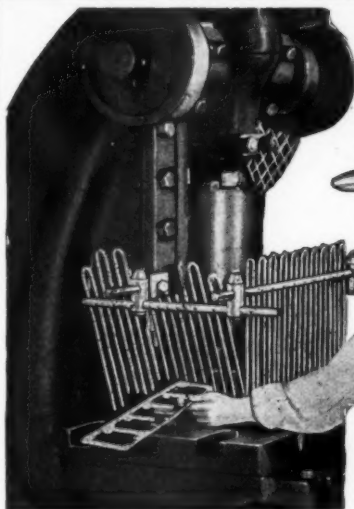
Ratio of blank to finished part diameter is slightly over 3 to 1. Being under  $\frac{1}{8}$ -inch thickness, we add one, giving four draw operations. Recommended allowance for earring and trimming is obtained by multiplying the cross sectional area of the finished shell by  $\frac{1}{4}$  by the number of operations: in this case  $10.064 \times 3.1416 \times \frac{1}{4} \times 4$  or 31.6. inches.

Added to the 773 previously, we have 804.6 square inches, giving a blank 32 inches in diameter. Stages now become: First draw  $32 \times 0.58$  or 18.56, say  $18\frac{3}{4}$  inches; second draw  $18\frac{3}{4} \times 0.78$  or 14.6, say  $14\frac{1}{2}$  inches; third draw  $14\frac{1}{2} \times 0.80$  or 11.8, say 12 inches; fourth draw  $12 \times 0.83$  or 9.96, say 10 inches.

From the final draw, it will be necessary to flatten the top flange and sharpen the bottom radius in a subsequent operation. Trimming and beading complete the job.

**Mr. James F. Lincoln**, President of The Lincoln Electric Co. announced the election of two additional members to the Board of Directors: **W. R. Persons**, general sales manager, and **K. F. Steingass**, superintendent electrode manufacture.

**C. W. Coslow**, vice-president in charge of manufacturing of the Los Angeles Plant, and **M. M. Mautner**, vice-president and secretary, were elected directors of the Plomb Tool Co. at the annual meeting of the stockholders, held recently in Los Angeles.



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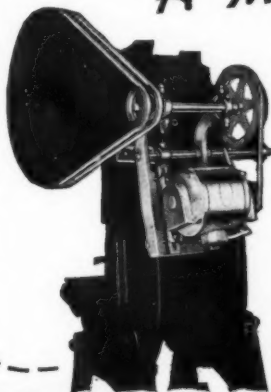
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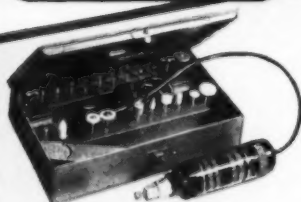
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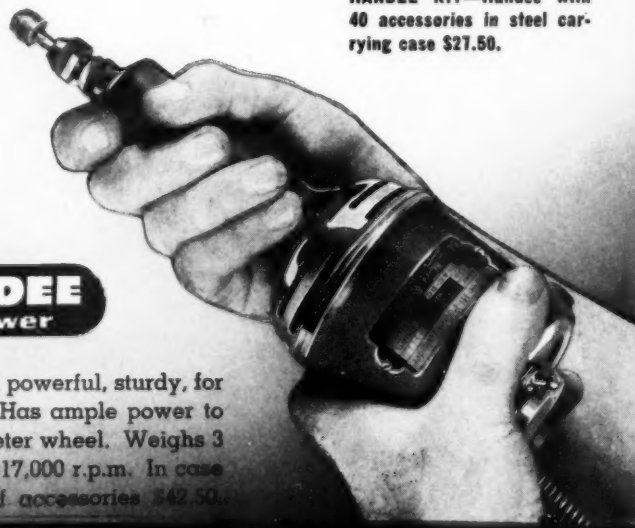


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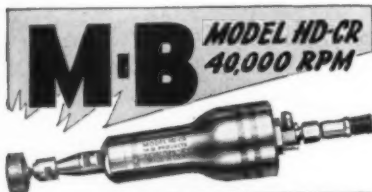
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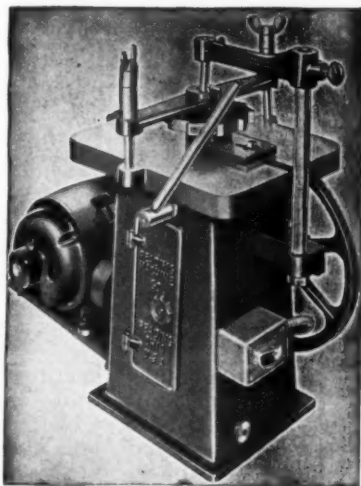
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#### **PRECISION BEARINGS**

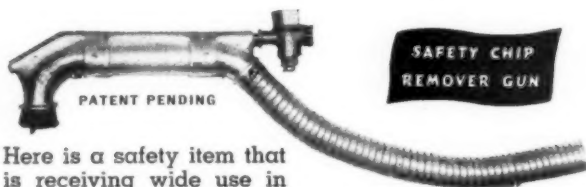
Describes bearings, cam yoke roller, cam follower, ball bearings and special bearings. Pictures of each type, including cross section illustrations. 12 pages. McGill Mfg. Co., Inc., Dept. BB, 111 N. Lafayette St., Valparaiso, Indiana.

#### **STEEL DISINTEGRATOR**

Illustrates and describes features, application and types available. 4 pages. Ansaldi Tool & Engineering Co., Dept. BB, 4744 Twelfth St., Detroit 8, Mich.

#### **BUFFS**

Describes complete line of bias type, loose, concentric sewed, radial sewed, spiral sewed, etc. Information on recommended usage, construction details and available sizes. 4 pages. The Manderscheid Co., Dept. 107, 810 Fulton St., Chicago 7, Ill.



Here is a safety item that is receiving wide use in machine shops, industrial plants and factories. It cleans depth holes thoroughly and safely without endangering the operator's eyes. This tool is handy to use and never requires cleaning. Made of tempered aluminum. Complete with all attachments.

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Pekin, Illinois

#### KEYWAY PUSH BROACH

Operating directions, specifications and prices and engineering data. Photographs showing application and samples of work. Comparison of work with shaper method. 8 pages. East Shore Machine Products Co., Dept. BB, 835 E. 140th St., Cleveland 10, Ohio.

#### PRESS ROOM EQUIPMENT

Covers Hydraulic stock feed, stock straightener and scrap cutter for use on punch presses. Controls and adjustments are identified and operating features are explained. Specifications. 6 pages. Haller Machine & Mfg. Co., Inc., Dept. BB, 7940 Tireman Ave., Detroit 4, Mich.

#### HYDRAULIC DIE CASTING MACHINES

Describes smaller capacity diecasting machines for zinc and aluminum alloys. Specifications, sectional drawings, photographs of work done and of machines. 12 pages. The Hydraulic Press Mfg. Co., Dept. BB, Mount Gilead, Ohio.

#### SAFETY DRILL TABLES

Combination of drill table, vise, set of parallels and v-block. Available with pedestals for radial drills. Shows how replaces round and square tables on drill press. Shows samples of set-ups. 8 pages. Modern Machine Tool Co., Dept. BB, Jackson, Mich.

#### MULTIPLE STEEL HEADS

Shows adjustable heads for drilling, reaming and tapping. Cross-section views of complete heads. Time and money saving features. 8 pages. U. S. Drill Head Co., Dept. BB, Cincinnati 4, Ohio.

#### CARBO-NITRIDING FURNACES

Compares results with liquid cyaniding and light case carburizing in mass-production industries. Describes operation and lists design features. Outline of procedure of designing individual furnaces and typical installations. 4 pages. Holcroft & Co., Dept. BB, 6545 Epworth Blvd., Detroit 10, Mich.

— MILLING —

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— MACHINES —



Above: No. 4 Motor Driven Milling Machine. Nos. 1, 2, 3, and 4 are specially suited for handling small, difficult work on a production basis.

**FOR SMALL, DIFFICULT WORK ON A PRODUCTION BASIS . . .**

#### GENERAL SPECIFICATIONS

| Mach. No. | Working Surface of Table | Longitudinal Feed | Traverse Feed | Vertical Feed | Maximum Distance between center of spindle and table |
|-----------|--------------------------|-------------------|---------------|---------------|--|
| 1         | 3½x12                    | 8                 | 3%            | 4½            | 5¼   |
| 2         | 3½x16                    | 6                 | 2             | 4½            | 5  |
| 3         | 3½x12                    | 8                 | 3%            | 7½            | 7½   |
| 4         | 3½x16                    | 8                 | 3             | 8             | 8  |

Write **TODAY** for complete information, specifications, attachments not shown in above table.

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#### AIR CONDITIONER

Window and floor types. Description and specifications, photographs and line drawings. 8 types described on separate sheets. **Kauffman Air Conditioning Co., Dept. BB, St. Louis, Mo.**

#### MONORAIL TRACTOR

Photographs of actual application and line drawing of typical application and dimension diagram. Features. 4 pages. **Detroit Hoist & Machine Co., Dept. BB, 8201 Morrow St., Detroit 11, Mich.**

#### PHOTOELASTICITY POLARISCOPES

Describes stress analysis and optical system. Optical diagrams and specifications covering assemblies, and description of accessories. 8 pages. **The Gaertner Scientific Corp., Dept. BB, 1201 Wrightwood Ave., Chicago 14, Ill.**

#### METAL MASTER

Describes 9 metal working operations possible with one machine. Indexed photograph. Specifications. Examples of work shown. 8 pages. **Clinton Machine Co., Dept. BB, Clinton, Mich.**

#### CUTTING TOOLS

Design features, specifications and prices. Line drawings of standard tips for use in holders together with sizes and prices. Grade selection and general data. 4 pages. **Econotool Co., Dept. BB, Box 262, Jenkintown, Penna.**

#### STATIONARY DIESEL ENGINES

Manufacturing practices. Component parts illustrated and described. Specifications. Design features and blueprints. Horsepower ratings and standard equipment. 28 pages. **The National Supply Co., Dept. BB, Springfield, Ohio.**

#### SPEED PHOTOGRAPHY

Examples of actual engineering and industrial problems solved by ultra-speed photography. Describes use of camera to analyze motion too fast for study by unaided eye. Information of operating characteristics and accessories of camera. 12 pages. **Industrial Photographic Division, Eastman Kodak Co., Dept. BB, Rochester 4, N. Y.**

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*Specify*

COMPACT DESIGN

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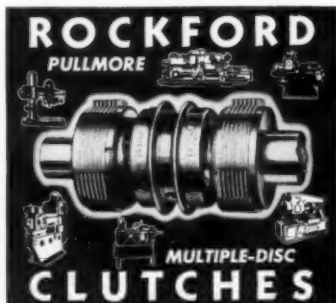
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Heat-treated alloy steel provides wear-resisting bearing surfaces that are machined to close tolerances. The shifter spool has a deep slot, hardened and ground, which prolongs clutch life and reduces shifter fork wear. Discs have flat, true surfaces, free from high or low spots. Thus operating conditions remain uniform, even after long service.

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*Pullmore Clutches are sold by Morse Chain Co., offices in principal cities.*



### **HOLE PUNCHING UNITS**

Units illustrated and described primarily used for punching rivet holes in sheets, angle and extrusions. Features shown in indexed photo and blue prints. Set-up methods. Ordering information. 16 pages. **Wales-Strippit Corp.**, Dept. BB, North Tonawanda, N. Y.

### **ROTARY GEAR FINISHER**

Principles involved in three finishing methods -- underpass, transverse and travelpass shaving. Recommendations for use of each method. Blue print drawings of front and top views and travel of contact area of three methods. Specifications. 4 pages. **Michigan Tool Co.**, 7171 E. McNichols Rd., Detroit 12, Mich.

### **DRAFT AND FILTER GAUGES AND MANOMETERS**

Detailed descriptions, construction and installation data and operating information. Five sheets on plastic tube manometers, transparent hook gauge, air filter gauges, portable and stationary draft gauges and "Air Velocities with the Dwyer Pitot Tube." **F. W. Dwyer Mfg. Co.**, Dept. BB, 317 South Western Ave., Chicago 12, Ill.

### **OILER WALL CHART**

Features 142 product reproductions, 2-color wall chart, 24" x 36", suitable for hanging. Chart depicts constant level and wick feed oilers, threaded and drive types, oil and grease seals, multiple oilers, grease cups, accessories and tools, with appropriate legend. Available upon request to Mr. Frank A. Kovarik, **Gits Brothers Manufacturing Co.**, 1830 S. Kilbourn Ave., Chicago 23, Ill.

### **PLANT SAFETY BOOKLET**

Illustrated 2-color booklet livened by cartoons explaining methods of avoiding industrial accidents; safety equipment, cleaning machinery, fire prevention, use of extinguishers, health hints, first aid, use of tools, cranes, and materials handling equipment. 24 pages. **Allegheny Ludlum Steel Corp.**, Public Relations Dept. BB, Pittsburgh 22, Pa.

### **DRILLING MACHINE**

New 2-color catalog, No. 67, illustrates and describes Model C-20 Drilling Machine. Design and advanced construction, operator efficiency, adaptability both to production work and tool room. Arrangement of controls illustrated. Geared tapping head with electrical reversing described. In English or Spanish. 4 pages. **Sibley Machine & Foundry Corp.**, Dept. BB, South Bend, Ind.

### **SUVENEER CLAD METALS**

Low carbon strip steel clad on one or both sides with copper, monel or nickel. Bulletin describes each type and applications. 4 pages. **Superior Steel Corp.**, Dept. BB, Carnegie, Pa.  
**Dept. BB, Milford, Conn.**

### **TUBE FITTINGS**

Describes role in sealing of higher fluid pressures. Engineering and design problems. Engineering specifications for no flare and flare type fittings. 12 pages. **Flodar Corp.**, Dept. BB, 331 Frankfort Ave., Cleveland, Ohio.

### **ELECTRIC CABLE HOISTS**

Features through description and illustrations. Design and construction. Specifications and prices. Ordering directions. 8 pages. **Lisbon Hoist and Crane Co.**, Dept. BB, Lisbon, Ohio.

### **ALUMINUM FOR LIGHTING FIXTURES**

Characteristics of aluminum. Shows extrusions used for housing frames, louvers, lighting "rails" for stairways, trough applications, etc. Sheet and die casting combinations include louver and gimbal designs. 12 pages. **Reynolds Metals Co.**, Dept. 47, 2500 S. Third St., Louisville 1, Ky.

### **AIRFLEX RIVETERS**

Diagram explains working principle. Photographs show actual jobs performed. Features illustrated and described. 4 pages. **Lemert Engineering Co.**, Dept. BB, Plymouth, Ind.

### **SHAPER**

Demonstrates variety of work possible. Specifications. Extra equipment. Construction features. Folder. **Ammco Tools, Inc.**, Dept. BB, Commonwealth Ave., North Chicago, Ill.



### **WORK ROUTING, SCHEDULING AND DISPATCHING IN PRODUCTION**

*By John Younger, A.S.T.E., (hon.) A.S.M.E., late professor and chairman of Department of Industrial Engineering, The Ohio State University; and Joseph Geschelin, Detroit Editor, Automotive and Aviation Industries, Vice-Chairman, Production Engineering Activity, S.A.E. The Ronald Press Co., New York. 1947. Third Edition. 168 pages. \$3.50.*

This is the third edition of a book originally published under the title "Work Routing". It has been widely used as a textbook in colleges of engineering, and schools of business where applied courses dealing with production are given. The text has been entirely re-written to bring it up to date. New case studies on mass production and descriptions of the new "process" machine method with master electrical controls have been discussed at length.

In the 24 chapters of this interesting text, the authors entered into a wide and detailed discussion of the basic forms of work routing, and the planning necessary for laying out entire schedules of manufacturing procedure. A chapter covering an interesting phase explains the importance of making an operation analysis, showing the sequence of operations.

The economics of mass production is discussed, with chapters on cost accounting and the coordination of engineering and production. A resume of centralized versus decentralized planning is expounded. Discussions on

Quality Control and Materials Handling, as well as complete descriptions of laying out a new plant, from the ground up, are gone into at length. The book closes with a chapter depicting the rhythm in manufacturing, including the widely discussed "Law of Material Flow" and further expositions of motion study.

### **GALVANIZING HANDBOOK**

*By John R. Daesen, consulting metallurgical engineer, Chicago, Illinois. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York. 1946. 166 pages, \$5.25.*

Although designated as a handbook, this volume presents a comprehensive picture of the basic principles required in the science of galvanizing, with numerous photographic examples which illustrate clearly the methods involved, as well as a detailed exposition of the types of coatings, and their effects on various metals.

The book is based on the premise that next to following one definite rule of procedure for any process, the best practice to follow is to have a basic knowledge of elemental properties and their reaction under various chemical changes. Among questions answered are the various chemical analyses of typical structures of zinc coatings; variations in the iron or steel base which is to be galvanized. The problems of fluidity control with temperature, and fluidity control with an aluminum addition are discussed.

To quote the author, "Many of the examples chosen were articles deliberately spoiled to indicate in an extreme manner, conditions which are difficult to illustrate in the degree usually encountered in practice."

Among the procedures of the galvanizing process which are covered in the twelve chapters are a digest explaining the changes in coating after dipping, and an explanation of the heat treatment of the coating. The subjects of

cleaning and pickling, fluxing, and hot dip coatings are also illuminated in some length.

The book contains a helpful appendix covering Tested Zinc Coatings, Preparation of Sections for Photomicrography, and A.S.T.M. Tables of Specifications for Slab Zinc and Zinc-Coated Steel and Iron Articles.

#### QUALITY CONTROL METHODS

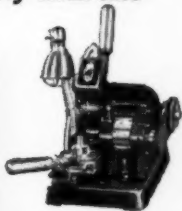
*By Clifford W. Kennedy, quality control engineer, Federal Products Corporation, Providence, R. I. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. 1948. 243 pages. \$4.75.*

This informative book contains much detailed information regarding a subject about which many supposedly well informed engineers talk glibly—but in circles—the science of Quality Control, and a discussion of the methods involved in its successful introduction in modern industrial plants. The book is divided into five sections. Part 1 consists of a discourse on Acceptance Sampling and its various ramifications. Part 2 treats of Batch Control, and the methods of securing accurate percentages of defective parts in sampling and inspecting large lots. Part 3 is a discussion on Distributions and the Standard Deviation. The statistical and mathematical aids to Quality Control cover the identification of satisfactory or defective parts, and the determination of more specific characteristics.

Part 4 takes up the questions of Average and Range, including the comparison between standard deviation in parts and average-range methods of checking or inspecting them; instruction in how to make average and range charts is given, with their correct reading. Part 5, the final section, is a Guide to the Administration of Methods of Quality Control, beginning with the actual preparation, the means of knowing where and how to start Quality Control techniques and commercial examples of applications. The book is furnished with an appendix containing logarithm tables and frequency distribution curve tables.

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**Rouse**  
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**\$98 (Without Fixtures)**  
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Fixture Set-Ups  
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It's a high-speed, motor-driven unit that has many uses in finishing operations for light cuts on aluminum, brass, steel and other metals... also, rounding and burring steel and cast iron. Inexperienced operators quickly learn to use it with speed and precision.

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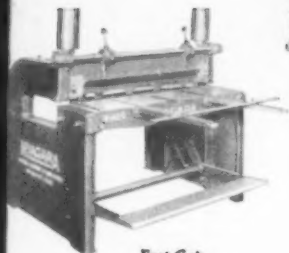
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# NIAG

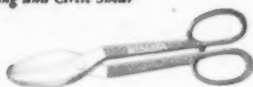
*Everything from*  
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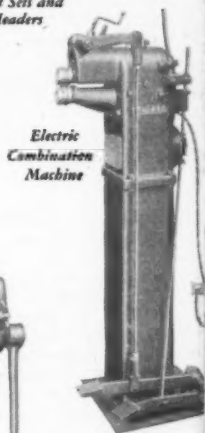
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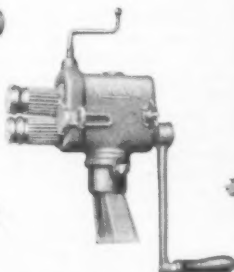
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### Makes Durable Patch or Complete Overlay

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#### THE DIAMOND WHEEL, ITS CARE AND USE

Norton Company  
Publicity Dept.  
Worcester 6, Mass.  
18 minutes. Kodachrome with Sound.  
Obtainable from The Norton Co.

This entirely new film discusses the proper care which is necessary in the handling, mounting, and dressing of diamond wheels. It portrays not only the precision in manufacture at the Norton plant but also gives recommended procedure to obtain the greatest possible benefit from each diamond wheel.

The film is complete in itself and may be shown alone, or may be used in conjunction with or as a preface to "Grinding Carbide Tools." These Norton Films are available to industrial apprentice schools, foremen's groups, vocational schools, colleges and universities—wherever machine shop practice is being taught. They will not transform any grinding operator or apprentice into an expert, but they will point out many facts about grinding that are important for every operator to know.

#### THIS IS MAGNESIUM

The Dow Chemical Company  
Midland, Michigan  
20 minutes. Sound. 16 mm. Obtainable from The Dow Chemical Company.

This is a film of a general nature which depicts the extraction of magnesium from ocean water, and indicates the possibilities of this metal as an engineering material. The film is designed to appeal to technical personnel as well as untrained workers. It is useful in showing the almost unlimited uses to which this metal may be put.

#### PIGS AND PROGRESS

Reynolds Metals Co.  
2500 So. Third St.  
Louisville 1, Ky.

*Full color. Sound. 16 mm. Obtainable from Reynolds Metals Co., Advtg. Dept., 2000 S. Ninth St., Louisville 1, Kentucky.*

This is the first color motion picture to show the production of aluminum from raw bauxite to finished products; it takes uninitiated personnel behind the scenes and tells in simple language the cycle of processes involved in the transformation of bauxite into its emergence as metallic aluminum.

Beginning with the mining of raw bauxite in Reynolds' mines, the scenes shift to Reynolds' alumina mills where the ore is converted into alumina, a white granular material; the alumina is then shown being electrically reduced to produce the finished aluminum in the Reynolds Jones Mills, Ark., reduction plant. Also shown are the mill operations involved in converting aluminum ingot to such forms as sheet, plate, wire, rod, bar, rolled and extruded

shapes, as well as many of the finished fabricated products. The illustration



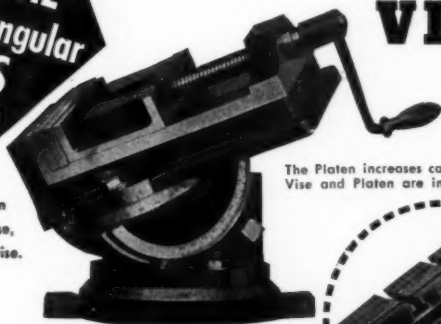
shows pouring molten aluminum into molds in connection with casting pigs, at the Listerhill, Ala., plant.

The film closes by showing the new and unusual building products, including aluminum siding, roofing, window frames, structural supports, and accessories demonstrated in actual use.

**SAVE TIME**  
on intricate, angular  
**SET-UPS**

Fully universal . . .  
three swivels simplify the  
setting of compound angles.  
Parts interchangeable . . . can  
be used as a plain flanged vise,  
a swivel vise or multi-swivel vise.

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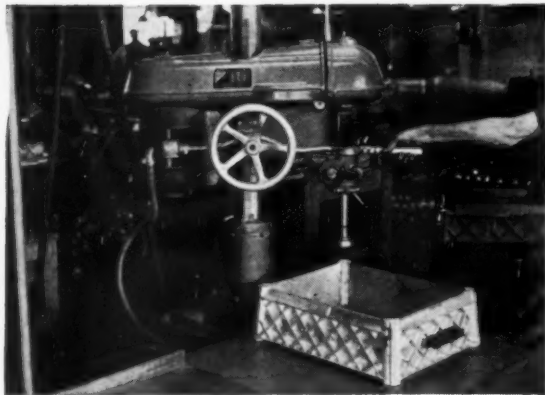


The Platen increases capacity of the unit.  
Vise and Platen are interchangeable.

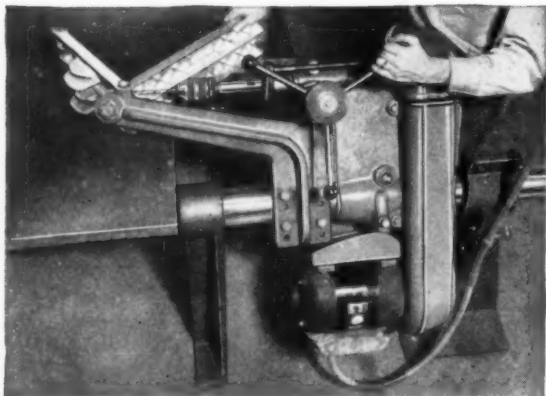


**MASTER TOOL CO.**

161 HIGH STREET • BOSTON MASS.



Using a Walker-Turner 20" Drill Press to do a surface grinding operation on aluminum flasks in radial motion.



Drill Head horizontally mounted. Work holding set-up locates work quickly; angle holes are drilled accurately.

3896

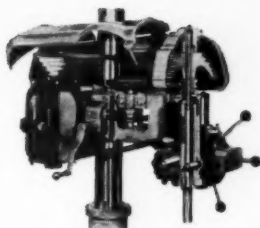


The hand chipping of sprues from aluminum castings created bad working conditions . . . holding foundry flasks by hand and drilling corner holes with vertical presses caused inaccuracies—these were the production difficulties at the Hines Flask Company, of Cleveland, Ohio.

Both problems were overcome through the flexibility of Walker-Turner 20" Drill Heads. Equipped with an abrasive wheel, they ground down sprues with minimum effort and noise—*production went up 500%*. Placed in a special fixture designed by Hines, they made it easy to drill holes of dependable accuracy—*drilling production went up 100%*.

Such are typical advantages gained from Walker-Turner Machine Tools. These high-capacity, low-investment units are flexible as to mounting, speeds and control. They handle all types of materials, perform many operations.

Whether used to meet unusual requirements, to free costlier equipment for other work, or to handle routine operations, Walker-Turner Machine Tools pay for themselves within a few weeks. *For complete catalog, write to Walker-Turner Company, Inc., Plainfield, New Jersey.*



20" Drill Head, Model D-1101X, Power Feed; D-1100X Hand Feed. Spindle travel 6"; 5 speeds—400 to 2600 r.p.m. Capacity 1", cast iron; ¾", steel. Slo-speed motor optional. Price: less motor and column, Power Feed, \$216.00; Hand Feed, \$135.00.

## SOLVES GRINDING AND DRILLING PROBLEM

*[INCREASES PRODUCTION 500%]*

WITH WALKER-TURNER 20" DRILL HEADS

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TOOLS

DRILL PRESSES—HAND AND POWER FEED • RADIAL DRILLS  
RADIAL SAWS • BAND SAWS—FOR WOOD OR METAL  
RADIAL METAL CUT-OFF MACHINES • MOTORS

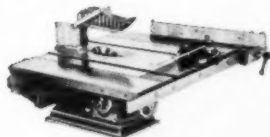


Table Saw, CB-970. Capacities: 8" saw cuts 2½" deep; 9" saw, 3" cut. Accommodates 6" dado. Price: less miter gage, motor, and extension tables, \$59.50.

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211

# News of the INDUSTRY

## APPOINTMENTS AND PROMOTIONS

### KEARNEY & TRECKER CELEBRATES 50TH ANNIVERSARY

Another distinguished company to join the ranks of companies 50 or more years old is the Kearney & Trecker Corporation, Milwaukee, Wis. From a humble beginning on May 17, 1898 K & T has expanded, in the last 50 years, into one of the leading machine tool builders in the nation.

Organized as a partnership by Edward J. Kearney and Theodore Trecker, the company for many years specialized in the manufacture of standard milling machines. A line of precision boring machines was introduced in 1942.

The company's original quarters was a small shop of 1200 square feet. Within three years sufficient business had de-

veloped to require an expansion of shop capacity. Through the years other buildings and property were acquired until today the Kearney & Trecker



Top, left to right: E. J. Kearney and Theodore Trecker, co-founders of the Kearney & Trecker Corp., and Francis J. Trecker, present president of the corporation. The first Kearney & Trecker shop in Milwaukee, Wisc. Today the plant covers more than 14 acres and employs 1,800 persons.



plant facilities cover more than 14 acres. The company employs 1,800 workers.

Among Kearney & Trecker contributions to milling machine design are the following: 1, all-gear spindle drive and feed change box; 2, automatic flood lubrication; 3, three-bearing spindle; 4, totally enclosed motor drive. In milling practice Kearney & Trecker pioneered in the application of tungsten and tantalum carbide milling cutters to cast iron and to steel.

In management the company has undergone the normal changes brought about by time. Edward Kearney died in 1934; Theodore Trecker, now 80, retired from the presidency in July, 1947. Succeeding his father was Joseph L. Trecker who died suddenly in October, 1947. Francis J. Trecker was elected president in November, 1947. Other management officers are: R. L. Bischoff, secretary-treasurer; J. B. Armitage, vice-president in charge of Engineering, and R. W. Burk, vice-president in charge of Sales.

#### NEW SIEWEK TOOL DISTRIBUTORS

Mr. C. D. Reason, President of Siewek Tool Co. announces the appointment of F. H. Robertson Tool Co., Inc. of Malden, Massachusetts as exclusive stocking distributor for the New England States, and Acme-Danneman Co. of New York City as exclusive stocking distributor for Eastern New York and New Jersey.

The appointment of these two new distributors makes a total of six who carry a complete inventory of all Siewek Rapid Clamping Jigs, Fixture Locks, and Fixture Details. These strategically located inventories will prove invaluable to the customers of Siewek enabling them to obtain merchandise with the least possible delay.

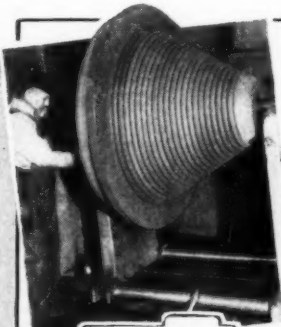
Mr. Reason states that in the near future they will have inventory stocks in such industrial centers as Cleveland, Philadelphia, and Indianapolis.

CASE REPORT No. 49 from a series of actual cases recording the successful application of BEAR DY-NAMIC BALANCING to Industry.

## BEAR BALANCER "TAMES" 1800-POUNDER

When this 48" Centrifugal-Dryer part was first rotated on the Bear Balancer, it whirled and whined with all the fury of Dy-Namic un-balance. In minutes, the operator "tamed" these 1800 lbs. of whirling metal into a smooth-performing Dy-Namically Balanced object.

This "act was performed" at Centrifugal & Mechanical Ind. and it is being repeated a hundred-fold by manufacturers in many different lines, with rotating parts weighing from 4 oz. to 8 tons. Your operation is most likely well represented in our file of successful users of Bear Dy-Namic Balancing. Write for complete data and a copy of the latest Bear Industrial Balancing Catalog. Bear Mfg. Co., Dept M-20 Rock Island, Ill.



For over four years, Centrifugal and Mechanical Ind., Inc. of St. Louis, Mo., has successfully Bear-Balanced various centrifugal parts weighing from 25 to 1800 lbs

2657/M

**BEAR** STATIC AND  
DY-NAMIC BALANCING MACHINES



### 30TH NATIONAL METAL EXPOSITION

The 30th National Metal Exposition and Congress will be held in Philadelphia, Penna., October 25-29. The exhibits will be housed in the Commercial Museum and Convention Halls, located nine minutes from downtown hotels, on the campus of the University of Pennsylvania.

As in previous years the exhibit and congress will be sponsored by the American Society for Metals in cooperation with the American Welding Society, the Institute of Metals division of the America Institute of Mining and Metallurgical Engineers, and the Society for Non-Destructive Testing.

### NEW BUILDING FOR INDEPENDENT PNEUMATIC

Independent Pneumatic Tool Co., manufacturers of Thor portable power tools, announces the opening of a new administration building adjacent to its main works in Aurora, Ill. The building, constructed and equipped at a cost of \$1,500,000 will accommodate Thor's en-

tire executive and administratives staff, the major portion of which was transferred to Aurora from Chicago for consolidation with other office divisions previously located within the Aurora works. The company's Chicago sales branch will retain temporary headquarters at the former general office address, 600 West Jackson Blvd., Chicago, until another office building is completed sometime in the fall.

### DIAMOND ACQUIRES PARKER LINE

Effective May 1st, Diamond Machine Tool Co. purchased the complete line of Parker power squaring shears and Multi-Max punch presses. Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles, taking over Parker's inventory, tooling, blue prints, engineering specifications, etc.

### WALTHAM GRINDING WHEEL RELOCATES DETROIT BRANCH

The Waltham Grinding Wheel Co. announces the relocation of the Detroit factory branch. The new address is 1433 East 8 Mile Rd., Hazel Park, Mich. The new branch is under the management of Walter W. Hayden, recently appointed to the post.

### THOMAS E. HOFFMAN

Mr. Thomas E. Hoffman, retired executive of John H. Graham & Co. Inc., New York, died on May 12th at the age of 78. Before retiring ten years ago, Tom Hoffman was connected with John H. Graham & Co. Inc. for forty-seven years, and was Vice-President of the organization.

## BEVEL GEARS

PROMPT DELIVERY  
UP TO 12" DIAM. - 3 D. P.  
CUTTING ONLY or COMPLETE GEARS  
LATEST GLEASON EQUIPMENT



*Greaves* MACHINE TOOL CO.

BG 2013 Eastern Ave.  
Cincinnati, Ohio



### KNURL it Easily, Quickly, Safely

Use any Standard Knurls  $\frac{1}{16}$ " x  $\frac{1}{4}$ "



Two Sizes:  
 $\frac{1}{16}$ " to 2"  
2" to 4"

FOR LARGE OR SMALL LATHES

Joseph B. Fakes & Co., Royal Oak, Mich.

### PRECISION TOOLS

Toolmakers  
DeLuxe  
Vises

1-2-3  
Blocks

Whirligig  
& Centers

Edwall Test  
Gauge



## **PYROMETER INSTRUMENT CO. MOVES TO NEW JERSEY**

The demand for Pyro instruments, including Optical, Radiation, Surface, Immersion, and Indicating Pyrometers over the past quarter-century has required repeated expansion of the manufacturer's facilities. On March 15th, the firm moved its plant, laboratory, and offices to its new address, The Pyrometer Instrument Co., Inc., Bergenfield, N. J.

## **RECORD PAY-OFF**

Because of an idea that paid off, Frederick W. Thorpe, machine repairman at SKF Industries, Inc., is \$600 richer. William L. Batt, president of the Philadelphia ball and roller bearing firm, presents check for that amount—the highest yet paid by the company and one of the largest ever made in the Philadelphia area for an employee suggestion. Thorpe's idea will save the company an estimated \$4,000 annually.



Amounts of awards are unlimited and are based on 15 per cent of the yearly net savings to the firm. If actual savings exceed \$4,000, Thorpe will be paid his percentage of the difference.

His suggestion was prompted by frequent breakage of chain link belts on precision ball grinding machines. Chains would expand and ride off their

sprockets, causing costly production delays. Thorpe proposed installation of tension pulleys on sprocket chains to take up the slack. To date, his idea has been applied to 20 of 36 grinding machines with the result that replacement and maintenance costs have been cut more than 50 per cent.

## **TRI-LINE CORPORATION FOUNDED**

Formation of the Tri-Line Corporation, with main offices at 170 Franklin St., Buffalo 2, N. Y., and with branch offices at 135 Spring St., Rochester 8, and 357 Coolidge Ave., Syracuse, has been announced by C. C. Tiedman, president of the new corporation, and formerly a partner of Industrial Equipment Co., Buffalo.

Tri-Line Corporation takes over the distribution and field engineering on resistance welding equipment produced by Progressive Welder Co., of Detroit and the air and hydraulic equipment formerly handled by Industrial Equipment Co.

G. H. Schliecker, who was also a partner of Industrial Equipment Co., is vice-president of the new corporation. He will also be located at the main office and represent Progressive Welder Company. L. H. Schliecker is in charge of the Syracuse office with L. H. Henry in charge of the Rochester office.

## **FEDERAL PRODUCTS PURCHASES ELECTRONIC EQUIPMENT**

Federal Products Corporation has purchased all rights and physical equipment for the manufacture of the electronic circuits used in the Electronic Comparator and Sortron-Matic Automatic Sorting Gages formerly designed and manufactured by Foote, Pierson & Co., Inc., Newark N. J.

All drawings, manufacturing equipment and stock used in the production of this apparatus have been moved to Federal's main plant at Providence, Rhode Island where the company will continue the manufacture of various electronic gaging equipment such as Electronic Comparators, Automatic Dimensional Sorting Gages and similar apparatus.

# BRIDGEPORT-DIAMOND MACHINE CO. FORMED

Announcement is made by John T. Kilbride of the formation of the Bridgeport-Diamond Machine Co., 2362 Main St., Stratford, Conn. The Diamond Machine Co. of Philadelphia was purchased from the American Engineering Co. of that city and will be moved to the Bridgeport area. The use of the name Diamond will be continued where it originally applied to surface grinders when these machines were first built by Builders Iron Foundry of Providence, R. I.

The new company will manufacture face grinders in various sizes using segmental grinding wheels up to 66 inches in diameter, also vertical surface grinders and a full line of knife grinders for shear blades, paper knives, and tobacco knives.

John T. Kilbride, president of the new company recently resigned as president of the Bridgeport Safety Emery Wheel Co. He is well known in the industry, having had considerable experi-


ence in designing face grinders and other surface grinders, special machines and tools.

## GRAHAM & CO. ELECTS OFFICERS

John H. Graham & Co. Inc., 105 Duane St., New York City held its annual meeting on April 20th. The following officers were re-elected: Harold S. Graham, president; George W. Eckhardt, vice president; George A. Graham, secretary; M. A. Nixon, assistant secretary. S. L. Goldsmith was elected treasurer of the company. Mr. Goldsmith has been a member of the organization for the past ten years, serving as an executive in various departments of the business.

## FIRM TO PRODUCE PLATING RACKS

Mr. J. F. Reed, Jr. announces the opening of a new company to be known as The J. F. Reed Mfg. Corp. New Haven, Conn., which will specialize in the design and manufacture of plating and heat treating racks and accessory equipment.




Release

### SAFETY WORK-STOP *for drill presses*

Easily installed  
and operated

Pull to work  
it's locked—

Any angle



| Stop No. | Width (Table) | Depth F. O. B. | s.p.  | Weight  |
|----------|---------------|----------------|-------|---------|
| 1 B      | 12 - 16       | 10 - 16        | 13.95 | 6 lbs.  |
| 2 B      | 16 - 24       | 16 - 24        | 15.95 | 8 lbs.  |
| 3 B      | 24 - 30       | 24 - 30        | 17.95 | 10 lbs. |

**KAY MANUFACTURING CO.**  
Columbus, Indiana

## USE ECONOMY

Headless  
Set  
Screws





**ECONOMY  
MACHINE PRODUCTS  
COMPANY**



Socket  
Set Screws

Try Them On Your Next Job!

ECONOMY  
MACHINE PRODUCTS  
COMPANY

5212 Lawrence Ave., Chicago 30, Ill.

## PROGRESSIVE ESTABLISHES WEST COAST FACILITIES

Expansion of West Coast facilities for industrial service in this area has been announced by A. P. Seedorff, West Coast representative for Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, producer of all types of resistance welding equipment.

Included in the new setup, located at 1161 East Florence Ave., Los Angeles 1, Calif., are assembly and service facilities for Progressive's welding machines. Parts for the company's standard lines of welding guns will be stocked, as well as numerous standard complete sub-assemblies for gun-welding installations. Also being provided are manufacturing facilities for special adapters, welding dies, special electrodes, and similar special parts not carried in stock.

Complete service facilities for reconditioning and repair of resistance welding equipment has also been provided. This includes not only the welding equipment proper, such as machines and guns, but also mechanical and electronic control equipment. Provision has been made to perform minor service adjustments and service operations in customer's plants in addition to the major service work at the East Florence Street plant.

## COMPANY SPECIALIZES IN HONING WORK

Announcement is made of the formation of the Micro-Mara Corp., Cincinnati, O., specializing in honing work. Parts having plain, straight through blind and/or interrupted bores can be honed successfully. Production work will be under the supervision of R. C. Marah. Bores of from  $\frac{1}{2}$ " to 12" in diameter by  $\frac{1}{2}$ " to 45" long can be accommodated with any type of finish desired.

Lee Stratton has been appointed merchandise director of the Parts Division of the Reynolds Metals Co., Louisville, Ky., and Sublette M. Walton is the new industry manager of the Alumi-Drome Division.

## SAPPHIRE PRODUCTS ANNOUNCES PRICE REDUCTIONS

General price reductions ranging from seven to twenty-five per cent on all sapphire plug gages were announced recently by the Sapphire Products Division of the Elgin National Watch Co.

In announcing the price revisions, John F. Ireland, sales manager, said that the Sapphire Products Division has never increased prices and has kept the same "standard of precision" although, since the end of the war, costs have increased.

Announcing the manufacture of new large size gages up to .800", Ireland stated that the new price reduction will affect all gages from .250" and up. "This downward revision in prices has been made possible through recently developed manufacturing techniques in the fabrication of sapphire," he said.

## ROCKFORD INDUSTRIAL EXPOSITION

Approximately 100 Rockford manufacturers displayed their wares at an exhibition sponsored by the Junior Chamber of Commerce of Rockford, Illinois, June 6-9. The show was designed to bring Rockford's industrial products to the attention of Rockford's citizens, and considering that products ranging from furniture to foundry equipment was shown, seemed to have done so very well. Among metalworking industries represented at the exhibit were: Wales-Beech Corp.; W. F. & John Barnes Co; Elco Tool & Screw Corp.; Barber-Colman Co.; Rockford Screw Products Co.; Rockford Brass Works; Jos. Behr & Sons; Champion Foundry & Machine Co.; Mattison Machine Works; Greenlee Bros. Co.; Ekstrom-Carlson & Co.

On Tuesday the Swedish Centennial Delegation, led by Prince Bertil of Sweden, visited the exposition.

Square D Co. Detroit, Michigan, announces the appointment of J. L. Stanford as head of the Square D Switch & Panel Division, Advertising Section. Mr. Stanford replaces G. La Piner who leaves Square D to join Evans Products Co.



Iron & Steel Products, Inc., Chicago, announce the appointment of **Frank M. Sweeny** as sales representative in the Baltimore, Maryland district.

**Rodney B. Campbell** has joined the Lynn Co., Burbank, Calif. as chief hydraulic engineer, according to Ted Lynn.

**David D. Wood**, sales engineer on the staff of the Superdraulic Corp., Detroit, Mich., has been promoted to general manager, it was recently announced by Harry L. Wise, president.



David D. Wood



Charles F. Kennedy

The Kennedy Valve Manufacturing Co., Elmira, N. Y. has announced the election of **Charles F. Kennedy** as president, promoted from vice-president and works manager. **Matthew E. Kennedy**, president since 1938, was elected chairman of the board of directors, and will retain his position as treasurer.

**Frank R. Palmer**, vice president in charge of sales, was elected president of The Carpenter Steel Co., Reading, Pa., to succeed **J. Heber Parker**, who was named chairman of the board, and who will remain actively in charge of company policies. **Ransford V. Mann** succeeded to the post of vice president in charge of sales.

The Reed Rolled Thread Die Co., Worcester, Mass., has appointed **Edward F. Galvin** of the Tool Sales Co. as their representative in Metropolitan New York and Southwestern Connecticut, and **Fred E. Durre** of the Production Tool Sales Co. as their representative in Northern New Jersey.

**L. C. Watson**, formerly with Trumbull Mfg. Co., has been appointed sales manager of distributor sales of the Allen-Bradley Co., Milwaukee, Wis.

**James M. White**, formerly vice-president in charge of manufacturing at Allis-Chalmers' Milwaukee plant, has joined the Allen-Bradley Co., production management staff, Milwaukee, Wis.

**Fred J. Heid** has been appointed general manager of Ekstrom, Carlson & Co., Rockford, Ill., to replace **S. P. Ekstrom**, former president and sales manager, who has been appointed chairman of the board of directors.

**Charles S. Traer** was elected chairman of Acme Steel Co., Chicago, following the retirement of **Ralph H. Norton**. **Carl J. Sharp** succeeds Traer as president.

Swan-Finch Oil Corp., New York City, has appointed **Nelson V. Joyce** vice president in charge of purchasing, and **John M. Parker, Jr.**, sales manager of the tractor division.

**John E. Barbier** has been appointed sales manager of the Murchey Machine & Tool Co., Detroit, Mich., and placed in charge of tap sales for the Sheffield Corp., Dayton 1, Ohio. **Frank A. Henry, Jr.**, has been named field sales manager for Murchey products, and **Fred L. Graham**, field sales manager for Sheffield taps.



John E. Barbier



Joseph H. Humble

**Joseph H. Humble** of the Kester Solder Co., Chicago, has been appointed general sales and advertising manager, as announced by F. C. Engelhart, president.



**George P. Gradolf**, vice president and treasurer of the Cincinnati Bickford Tool Co., was elected chairman of the board and treasurer; **Ozni E. Schauer** was chosen president and general manager of the company. Elected are **Neil C. Schauer**, vice president and sales manager, and **L. Lee Schauer**, vice president and chief engineer.

The Simpson Electric Co., Chicago, announces the appointment of **Melvin O. Buehring** as sales manager; **Theodore Franks** has been named to succeed Mr. Buehring as assistant sales manager.



**S. A. Brandenburg**



**Kermit T. Kuck**

Two new vice presidents of The Monarch Machine Tool Co. were announced by **Jerome A. Raterman**, president. **Stanley A. Brandenburg**, general sales manager, was made sales vice president, while **Kermit T. Kuck**, chief engineer, was named engineering vice president.

**William P. Good**, has been appointed head of the department of Applied Welding Engineering, and **Virgil Carlson**, is the new director of the Electrical Engineering Department of the Mid-States Equipment Corp., Chicago, it was announced recently by **F. V. Lockefer**, general manager.

The Ball & Roller Bearing Division of Link-Belt Co. announced the appointment of **Arthur E. Maha** as asst. sales manager for the central division, with headquarters at the Dodge plant, Indianapolis. Announcement is also made of the appointment of **Lewis M. Watkin, Jr.**, as assistant sales manager for ball and roller bearings in the eastern division, with headquarters in Phila.

## SCHERR aids to precision — production



### ATLANTIC (adjustable limit) SNAP GAGES

Made in strict accordance with American Gage Design Committee specifications. Frames of Mechanite. Wide range of sizes, from .195 to 11 1/2". With round or square gaging pins.

solid anvil, extended anvil, etc. The last word in snap gages, and at most interesting prices. Write us for details—and also about the Scherr special service for trueing and setting worn gages.

### SCHERR TOOL STAND

Cuts inspection time almost in half by freeing both hands of operator, and holding micrometer or snap gage in most convenient position. Also prevents body heat affecting tool readings. One of those small, inexpensive items worth many times its cost in saved time. Try a few—then order a quantity. Price, \$7.50.



### SCHERR DIAL INDICATORS

Last longer and cost less. Have an exclusive mechanism of extra sturdiness, with only three moving parts. No quick spinning wheels nor unhardened racks. Furnished with standard back or with ball-joint back for setting at any angle. Contact points for all needs. With clamp holder, extension bar, toolpost holder, in compact metal case. Indicator only, \$10. Complete set with universal attachments, \$19.75.



Write for the Scherr Small Tool Catalog describing the other Tools.

**GEO. SCHERR CO., Inc.**

198 - Lafayette St. New York 12, N. Y.

**W. S. Austin**, sales manager of LeMaire Tool & Mfg. Co., Dearborn, Mich., has been elected vice-president of that company, according to announcement made by the company's president, Wayne Sinclair. He will continue as sales manager.



W. S. Austin



Allen W. Lovell

**Allen W. Lovell**, general manager, has been elected vice president of Modern Collet & Machine Co., Ecorse, Michigan. He joined this company as sales manager in 1944 and was appointed general manager in 1946.

**William D. Nesbeitt** has been named manager of Allis-Chalmers Spokane district office, according to an announcement by J. L. Singleton, vice president and director of sales of the company's general machinery division.

**E. C. Lanno**, formerly of the Detroit Diesel Engine Div. of General Motors Corp., has been named Development Engineer of the Rockford Clutch Division of Borg-Warner Corp.

**W. R. Hough**, was elected engineering vice president of The Reliance Electric & Engineering Co., Cleveland 10, Ohio, it was announced by J. W. Corey, president.

**Robert L. Ledbetter** has been appointed sales representative for the Buckeye Tools Corp. in Texas and Oklahoma, according to an announcement by H. O. Gummere, vice-president of the Dayton, Ohio firm.

"This multiple drill head has increased our torch cone end production by about 600%."



#45 DRILL SIZE

When this MULTI-DRILL went into operation with a seven-station full automatic step drilling machine, welding torch cone end production at the Victor Equipment Co., manufacturers of gas welding and flame cutting equipment, went up "about 600%."

Why not see how your production can be increased with a MULTI-DRILL—the production drilling head designed for accurate high speed drilling? Available with 2 to 8 spindles; quickly and easily adjusted to any hole pattern on or within a 9" circle;  $\frac{1}{4}$ " min. center distances. Drill sizes  $\frac{1}{32}$ " to  $\frac{3}{8}$ ". Special adaptations available.

Write for details and name of your nearest Distributor

**COMMANDER MFG. CO.**  
4227 W. Kinzie Street • Chicago 24

Product of *Commander* — Builder of the *Commander Tapper*

**Major General Cecil R. Moore**, for four years chief engineer in the European Theater of Operations, has been named manager of the construction department, Shops Division of Koppers Company, Inc. The appointment of General Moore was made by Walter F. Perkins, vice president and general manager of the Koppers' Shops Division.

**Halsey F. Owen**, professor of industrial engineering in the department of General Engineering at Purdue University has been named chairman of the National Education Committee of the American Society of Tool Engineers, according to an announcement by Erwin F. Holland, the new ASTE president.

**Omar V. Greene** was promoted from assistant general sales manager to manager of product development; **H. Sturgis Potter** was promoted from manager of tool steel sales to sales manager in charge of all Reading products at the Carpenter Steel Co., Reading, Pa.

The board of directors of The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, announced the appointment of **Howard M. Hubbard** as president, filling a vacancy created by the resignation of H. A. Toulmin, Jr., last November.

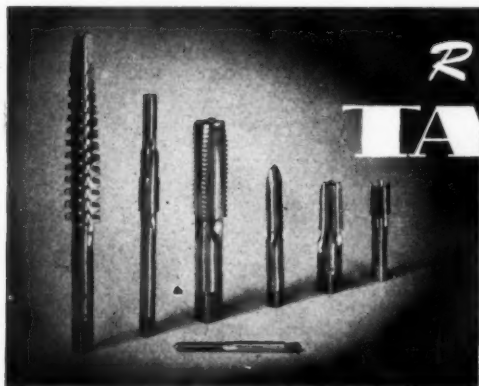


Howard M. Hubbard



Eugene W. Fuller

**Eugene W. Fuller** has been elected vice president of Shakeproof Inc. according to an announcement by Harold Byron Smith, president. Shakeproof Inc. is a division of Illinois Tool Works, Chicago, Ill.



R & N  
TAPS

Next time try R & N Taps.

Give long life, dependable service and are the favorite with hundreds of the largest and most exacting users.

Buy Reiff & Nestor Taps and get the benefit of wide experience, progressive engineering and precise workmanship.

Our stepped up production enables us to make prompt deliveries on both Standards and Specials.

**REIFF & NESTOR COMPANY**

manufacturers of TAPS AND REAMERS

LYKENS, PA.

**Charles B. Miller** has been appointed district sales manager of Goodyear Tire & Rubber Co.'s Mechanical Goods Division at Chicago, it was announced by **H. D. Foster**, division manager. The district embraces Illinois, Wisconsin and southern Indiana. Miller succeeds **Guy E. McMahon**, who will remain in Chicago as special representative for Goodyear industrial rubber products.



**Charles B. Miller**



**Boris M. Volynsky**

**Boris M. Volynsky** has been named manager of the New York office of the Simmons Machine Tool Corp., Albany, N. Y., according to an announcement by **Charles A. Simmons**, president.

The election of **D. W. R. Morgan**, of Philadelphia, and **John K. Hodnette**, of Sharon, as vice presidents, and **E. V. Huggins**, of New York, as secretary of the Westinghouse Electric Corporation, has been announced.

**D. A. Cullinan**, president of Western Foundry Co., Chicago, has announced that **Joseph P. Wright**, formerly treasurer, has been elected vice president in charge of sales, and **Frank D. O'Neil**, formerly assistant to the president, has been elected treasurer.

**Eaton Manufacturing Co.**, Cleveland, announces the promotion of **R. C. Ochs** to sales manager of its Saginaw Dynamic Division, Saginaw, Michigan.

**Roy F. Cratty**, recently associated with Greenlee Bros. & Co., Rockford, Ill., has joined the Industrial Advertising Division of The Cramer-Krasselt Co., an old well-established advertising agency of Milwaukee, Wisconsin.

Additions to field sales personnel are announced by **Stanley A. Brandenburg**, general sales manager of The Monarch Machine Tool Co.

**Fred B. Roth** has been transferred to San Francisco as Sales and Service Advisor for the west coast. **Donald J. Harshbarger**, is transferred to the New York office of the company. **Clarence J. Caldwell** and **J. A. Garrison**, will become field sales engineers for the company with headquarters in Chicago. **John P. Wisener**, goes to the Cleveland sales office.

**Walter Geist** was elected to his seventh term as president of the Allis-Chalmers Manufacturing Co. Milwaukee, and all directors and officers were re-elected at the annual meeting of the firm's stockholders and board of directors.

**D. E. Van Deusen**, president and general manager of Kelly Reamer Co., Cleveland, was elected president of the Cutting Tool Manufacturers' Association at the fourth annual membership meeting. He succeeds **E. A. Goddard**, president, Goddard and Goddard Company, Detroit.



**D. E. Van Deusen**



**Leslie McArthur**

**Niles-Bement-Pond Co.** Board of Directors, West Hartford 1, Conn., have elected **Leslie McArthur**, a vice president.

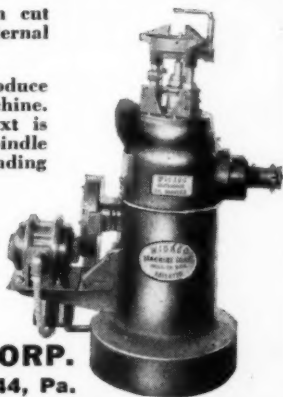
**Edgar A. Jett, II**, was named assistant director of Armour Research Foundation of the Illinois Institute of Technology, it was announced by **Dr. Haldon A. Leedy**, director of the foundation.

## OIL GROOVING made easy by WICACO

The WICACO Continuous Oil Groover can cut grooves of all descriptions INTERNAL or external — CONTINUOUS or intermittent.

Operators need no special training to produce oil grooves with this highly flexible machine. Change from one grooving job to the next is readily done without delay. Its upright spindle and chuck permit rapid loading and unloading of work without stopping the machine.

It will pay you to investigate the remarkable, low cost results the WICACO Continuous Oil Groover offers. Write today—outline your oil grooving problem and complete information will be sent without obligation.

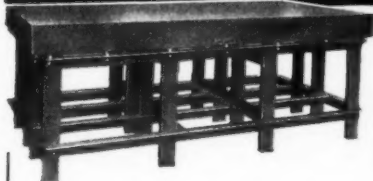


### THE WICACO MACHINE CORP.

Wayne Junction,

Philadelphia 44, Pa.

## "Precision Equipment by CHALLENGE"



**MEANS ACCURATE  
Trouble-Free PRODUCTION**

### CHALLENGE Semi-Steel Layout Surfaces PLATES

Insure the accuracy of repeated assemblies and layouts. True rigid surfaces of fine grained special analysis semi-steel and with precision ground or planer finish. Deep ribbing of the 6 inch deep plates prevent sagging or yielding under load. Furnished in 13 standard sizes with or without sturdy arc-welded steel stand with lock-leveling screws.

503

### CHALLENGE SURFACE PLATE EQUIPMENT

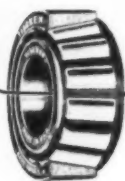
Made of fine-grained special analysis semi-steel castings. Specially heat-treated and precision ground to required accuracy. **SOLID** and **BOX PARALLELS**, **ANGLE PLATES**, **V-BLOCKS** and **UNIVERSAL IRONS** in a wide range of sizes. Write today for latest Catalog!



## THE CHALLENGE MACHINERY CO.

GRAND HAVEN, MICHIGAN, U.S.A.

TIMKEN *Zero precision bearings*  
 give SHELDON LATHES  
 GREATER ACCURACY—



Because the spindle of the Sheldon TRB-S56 is mounted on **Timken Zero Precision Bearings** extreme accuracy, higher machining speeds and lower production costs are insured.

**Timken Zero Precision Bearings** are by far the most accurate tapered roller bearing that can be made in regular commercial production. Runout or eccentricity is restricted to less than .00015 of an inch. Cups and cones of Timken Zero Precision Bearings are matched and shipped as a complete unit.

Due to the line contact between the rolls and races, the spindle is firmly supported — no chance of deflection. Because of the tapered construction and provision for take-up in assembly, there is no possibility of end-movement. Zero Precision Bearings are Timken's very finest, the ultimate result of Timken's 49 years of research and development.



**SHELDON** TRB-S56

11 1/4" Swing  
 1" Collet Capacity  
 56" Bed  
 Zero Precision Bearings

**SHELDON MACHINE CO. Inc.**

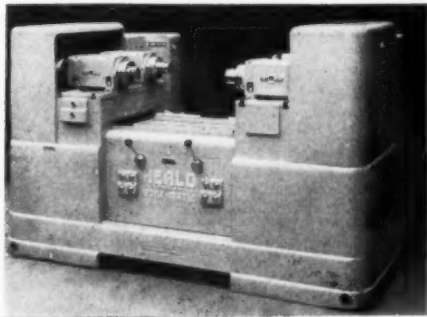
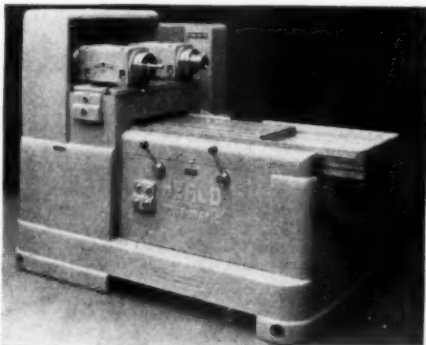
Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers  
 4242 N. KNOX AVENUE • CHICAGO 41, ILLINOIS, U. S. A.

# *What's New in* **METALWORKING**

## **NEW HEALD MODELS 421 AND 422 BORE-MATICS**

Augmenting the new Heald line of internal, surface grinders, and Bore-Matics, the Heald Machine Co. announces two more Bore-Matics, Model 421 and 422. These machines fulfill a demand for a large standard machine to handle heavy work without the necessity for special out-size equipment. The new units can perform boring, turning, chamfering, grooving, facing, or fly-cutting operations separately or in any desired combination.

These new Bore-Matics combine speed and versatility, despite their heavy construction and capacities. The single end Model 421, and the double end Model



422 are useful for mass production of a single part requiring several operations, or for single or multiple operations on several parts simultaneously.

The highly productive cycles of these machines, obtained through increased tempo of all cycle elements, including table traverse speeds, boring head speeds, and the starting and stopping of heads, maintain a uniform high rate of production. Adequate power for roughing, up to 10 h.p. is available at each end of the machine, providing maximum power for heavy roughing cuts and higher



speeds when using multiple heads. The permanently lubricated boring heads require no attention, and are cool running. From one to four boring heads, or a special multi-spindle head unit can be installed on each bridge.

The hydraulic system, incorporating a constant pressure dump valve furnishes only the amount of oil required during each phase of the operating cycle. The hydraulic feeds remain constant, regardless of oil temperature changes.

Efficient table and boring head action provide fast cycles. Both models have table feeds in the fast range, for in-feed, of from  $\frac{1}{2}$  to 50 i.p.m. The slow range, for in or out-feed, or both, is from  $\frac{1}{2}$  to 40 i.p.m. Table traverse is 23 f.p.m. The width of the table in each unit is 21 $\frac{1}{2}$ "; distance from table top to the floor is 33", and from table top to the top of bridges is 8".

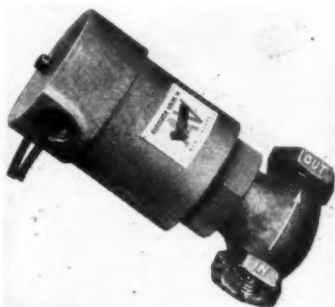
Several characteristics feature these two new Heald machines. The hydraulic system, of valve and core plate construction requires a minimum of piping; it is designed to eliminate leakage and prevent entry of foreign matter. Provision has been made on the main control panel for installation of hydraulic fixtures, cross slides, chucks, etc.

Specification sheets on both Model 421 and 422 are available upon request from the manufacturer, as well as performance data and other relevant information. Address:

**The Heald Machine Co., Dept. BB**  
Worcester 6, Mass.

## NEW PILOTLESS LEAKPROOF SOLENOID VALVE

The Airmatic Valve, Inc., introduces a newly engineered, model DS-2 direct operated solenoid valve. The new unit needs no pilot or other medium for operation, and the effective orifice area is equal to that of the pipe line. The valve is available in the standard pipe sizes from  $\frac{1}{4}$ " to 3".



Designed to eliminate packing requirements, and having corrosive resistant internal parts, assures the valve long production life. From on the job tests, the Airmatic DS-2 Valve proved that the removable resilient rubber type seat provides a leakproof seal.

Proof of its importance to industrial users is that the new valve is adaptable and can operate on direct or indirect current voltage and with various fluids such as oil, water, steam, air or freon.

**Airmatic Valve, Inc., Dept. BB**  
1643 East 40th St.  
Cleveland 3, Ohio



## PROPELLER REAMER

| No. | Dia. Small End   | Dia. Large End    | Shank Size Taper | Overall Length     | Price Net |
|-----|------------------|-------------------|------------------|--------------------|-----------|
| 0   | $\frac{1}{2}$ "  | 1"                | No. 2            | 12"                | \$10.50   |
| 1   | $\frac{3}{8}$ "  | $1\frac{1}{2}$ "  | No. 3            | 16 $\frac{1}{2}$ " | 19.35     |
| 2   | $1\frac{1}{4}$ " | 2"                | No. 4            | 18"                | 26.98     |
| 3   | $1\frac{1}{2}$ " | 2 $\frac{1}{2}$ " | No. 4            | 22"                | 47.25     |

This special Reamer reams the tapered hole in marine propellers. It has the following outstanding features:

- 1—Taper  $\frac{3}{4}$ " per foot. Morse taper shank for use in drill press or lathe.
- 2—Left hand, spiral, odd number of flutes. This gives a smooth shearing cut, does not damage keyways and eliminates chattering.
- 3—Flutes are notched. This breaks up chips and releases drag on cutting edge.

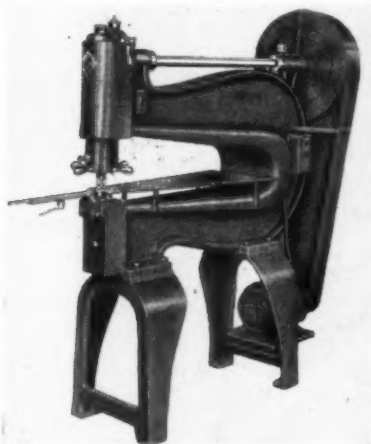
**TRAVERS TOOL COMPANY**

5th COURT SQUARE  
LONG ISLAND CITY 1, N. Y.



## NIBBLING MACHINE ATTAINS 450 STROKES PER MINUTE

W. J. Savage Co., pioneer manufacturers of nibbling machines, announce their new model, No. 236, developed for use in engineering, experimental, sheet metal, machine shop, production, and tool room departments. According to a series of time study charts included in a bulletin issued by the company, the use of this machine has saved users up to 90% in time spent in cutting out parts with the use of templates.



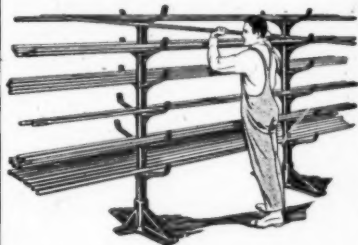
Features incorporated in the illustrated model include a direct over-center-drive, one-piece revolving head, and a totally enclosed front. A removable steel support plate, and a 36" depth of throat, level with the cutting table are provided. The unit will deliver 450 strokes per minute when powered by a 2 h.p., 1800 r.p.m. motor. The nibbler's capacity in mild steel is  $\frac{1}{4}$ " in soft metal,  $\frac{9}{32}$ ", and in tough steel,  $\frac{1}{8}$ ". Overall dimensions: height, 72", width, 20", length, 66". For complete specifications and performance data on this product, write:

**W. J. Savage Co., Dept. BB**  
**Knoxville, Tennessee**

When Writing Advertisers Please Mention **MACHINE** and **TOOL BLUE BOOK**



Each **BROWN SECTIONAL RACK** combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The **BROWN SECTIONAL RACK** is a simple, durable article built in five styles from standard interlocking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal throughout, depreciation is practically nil. **SEND FOR BULLETIN NO. 26-B.**

## BROWN SECTIONAL RACK

**BROWN ENGINEERING CO.**

**126 N. THIRD ST. READING, PA.**

RACKS • VISES • CLUTCHES • COUPLINGS

## WICKES GRINDING WHEEL SALVAGING MACHINE



The Wickes Grinding Wheel Salvaging Machine is a new product recently added to the Wickes Bros. line. This unit is capable of handling grinding wheels up to 42" in diameter, and 14" thickness. Wheels that have served

their useful life on one type of grinding machine can be re-worked for subsequent use on another grinding operation. The outside diameter and the sides can be turned down, or the bore enlarged.

The machine is also suitable for doing angular work on grinding wheels. It is powered by means of a 5 h.p., d.c. main drive motor for operation of the main spindle over a wide speed range. The weight, including electrical equipment contained on the machine, is 10,000 lbs. For additional details, write:

**Wickes Brothers, Dept. BB**  
Saginaw, Mich.

Appointment of **H. S. Hagan** as acting manager of the Butler, Pa., plant of Pullman-Standard Car Manufacturing Co., replacing **R. M. Fox**, manager of works, granted a leave of absence, was announced by **Norman B. Johnson**, assistant executive vice-president of the company.

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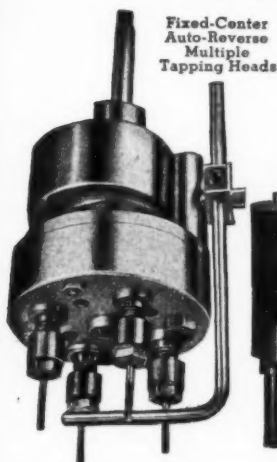
Ask for GROBET by name at your nearest supply house—the most complete line of Swiss Precision Files, Riffilers, Rotary Files, Burs, American Pattern Files, etc., etc.

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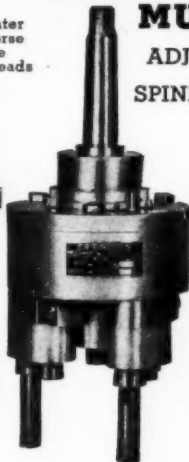
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**McGILL CARBIDE TOOL CO.**

4612 Woodward Avenue

Detroit 1, Michigan

### CENTRALIZED COUNTING FOR PRODUCTION CONTROL

Increased facility in counting and controlling production of machines, inspection and assembly work and other manufacturing operations is claimed for Centralized Counting Installations developed by the Production Instrument Co.

The basic unit consists of Electric Counters grouped in a panel located in the Production Control Room. The Counters are arranged to register output of various machines, operations or movement of parts, sub-assemblies, etc., throughout the plant, maintaining a continuous up-to-the-second count of each operation right in the Production Control Room.

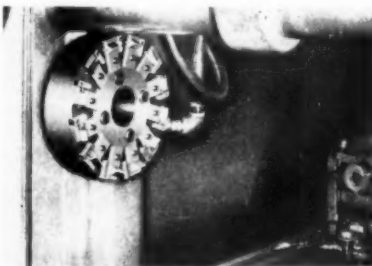


The illustration shows a Centralized Electric Counter Installation used in controlling production of fifty remotely located machines. Below each Counter is a special panel equipped with a two-pole, single-throw toggle switch, pilot light and plug-in receptacle. The 50 Counters maintain a continuous, up-to-the second count of pieces turned out by each of the 50 machines. The toggle switch is used to turn on counter and pilot light when the machine is started. The plug-in receptacle is used to connect a tape-recording device when a permanent record is needed for analytical time studies. Main variations of the above installation can be arranged to meet the specialized needs of each application. For complete information, write:

**Production Instrument Co., Dept. BB**  
704-14 W. Jackson Blvd.  
Chicago 6, Ill.

### NEW MILLING CUTTER USES TRIANGULAR CARBIDE INSERTS

A new milling cutter has just been announced by Diamond-Detroit, Inc. For face milling, this cutter employs the use of solid triangular carbide inserts which can be quickly and accurately adjusted or substituted in the cutter head while the latter is in milling position in the milling machine. When a blade becomes dull, it is turned to the next triangular cutting edge and after the three triangular cutting edges



on one end of the tool have been used up, the tool is reversed to the other end, so that in effect, each cutting element is the equivalent of six single point cutting tools.

Accuracy of resetting the tools in the holder without removal from the machine is achieved by bringing the blades up snugly against a stop pin. Since the cutting blades are ground accurate to close tolerances, all of the cutting elements will project equidistant from the cutter head.

Another advantage claimed is the simplicity of re-grinding. Worn or dull tools can be re-sharpened by simply squaring the ends on an off-hand grinder, setting both the table and protractor at zero. By the arrangement of the blades in the cutter head, the manufacturers claim that faster milling speeds and greater feeds are possible with this cutter. For complete details, write:

**Diamond-Detroit, Inc., Dept. BB**  
General Motors Bldg.  
Detroit 2, Mich.

Standard Since 1911



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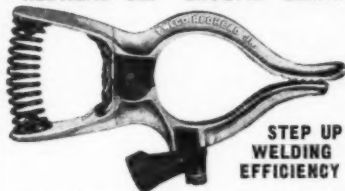
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TWECO Redheads are made in Midget 125  
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TWECOTONG Holders are made in 200, 250,  
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*Adjustable  
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# REELS



**Saves time, saves  
labor, saves trou-  
ble, keeps costs  
down.**

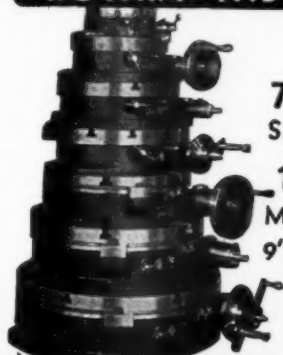
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complete control of stock  
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that stock never "gets away"  
or out of control.

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The Bendmore handles material up to 3/32" thick a full 12" wide. Good clean bends up to 135°. The machine is ruggedly constructed of semi-steel castings, the operating cam and steel insert in ram are heat treated to resist wear and give long life. Prompt delivery.

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**Carl Wirth & Son**

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**Bendmore**

SELF ADJUSTING  
BENDING MACHINE



#### DIE INSERTS FACILITATE MARKING METALS

Die inserts for marking parts produced by injection molding and die casting are now available from New Method Steel Stamps, Inc. Use of such inserts permits incorporation in die assemblies of part numbers, lettering, trade marks, instructions, or ornamental designs on both plastic and metal parts more economically than is possible when such information is made an integral part of the die, it is claimed.



A typical New Method insert is shown. Assembled in a die, it produces raised letters on the parts. The same type is used for either die castings or plastics.

A pantographic method of engraving is employed to produce the lettering on the dies, making it possible to produce embossed or debossed die inserts accurately.

New Method Steel Stamps, Inc.  
147 Jos. Campau Ave., Dept. BB  
Detroit 7, Mich.

#### NEW GRIPSO VISE PLIERS

H. R. Basford Co., announces a new kind of vise pliers called "Gripso", with an exclusive finger tip release, new jaw construction and double action adjusting screw. The new features are said to enable quick adjustment of the tool for ratchet or plier action, one hand lock and release, making the tool adaptable for use as a pliers, hand vise, nut wrench, pipe wrench or clamp, especially useful in hard-to-get-at-places.

The tool is said to have gripping range from light pressure to over a ton. The new finger tip release, which enables the user to unlock the pliers from any position with one finger, was



**Kutmoré**  
HIGH SPEED  
**ADJUSTABLE**  
HOLLOW MILLS

Designed for modern production requirements. Saves time, effort and motion. Has a two way micrometer adjustment with locking device to assure absolute cutting accuracy.

Kutmoré Hollow-Mills may be had with straight or taper shanks, high speed or Carbide Tipped blades. Insist on Kutmoré for accuracy, speed and economy. Prompt delivery. Write for Catalog No. 15.

**Carl Wirth & Son**  
1625 CLINTON AVE. N.  
ROCHESTER 5, N. Y.

designed to save time, and protect knuckles from being bruised by handles leaping apart. New jaw construction, employing a flat upper and curved



lower jaw, is said to double the resistance to side twist. For full information, write:

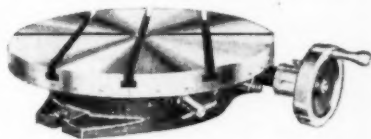
**H. R. Basford Co., Dept. BB**  
425 Second St.  
San Francisco 7, Calif.

#### **LIGHT-DUTY ROTARY TABLE FOR PATTERN SHOPS**

A new model Rotary Table has recently been added to their line by the Troyke Manufacturing Co. The new unit, designated as Model BL-21, is a large, light-duty table, especially designed for wood and metal pattern

work. The construction is similar to the firm's Model BL-18, except that the new model has a replaceable worm-wheel.

The turntable diameter of this model is 21"; the overall height is 5¼". Three T-slots are provided, allowing 9/16" entry; the space for T-bolt sizes is 5/8". The ratio, worm to wormwheel is 120:1. This new product should be a highly desirable unit for pattern shops due to its light weight and great versatility, a



feature vital to all-around pattern shop use. For complete details on the Model BL-21, write:

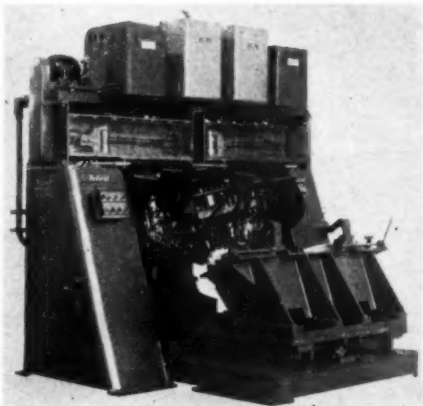
**Troyke Mfg. Co., Dept. BB**  
4422 Appleton St.  
Cincinnati 9, Ohio



## MULTIPLE SPOT WELDER HAS HIGH ACCURACY

A special ultra-speed Multiple Spot Welder for welding automobile dash panels has been built by The Federal Machine and Welder Co. This new production tool for the automobile industry enables a leader in the field to produce eighty completed parts per hour. To accomplish the quality required by modern industry at the rate a highly competitive field demands, this machine utilizes two ultra-speed units, two water-cooled transformers, and seventy-six hydraulically operated welding guns.

The ultra-speed units are located where they are easily visible and accessible for maintenance. The machine is designed so that the gun units are properly placed for easy and quick servicing of the electrodes. Mounted on a fabricated steel base, the carriage unit, consisting



of a die holder, dies, and necessary locators for positioning the work parts, moves in and out of the welding position by means of a hydraulic cylinder

## CUT ANY SHAPE BETTER with BEVERLY Throatless SHEARS



The No. B-3 BEVERLY Bench Type Shear with Ball Bearing Hold Down handles 3/16" or No. 10 gauge stainless steel. This sturdy shear weighs 58 lbs. and is equipped with H. C. H. Blades for heavy duty service.

*Let us send Bulletins giving full details on the BEVERLY LINE—*

**THE BEVERLY SHEAR MFG. CO., 3005 W 110th Pl., Chicago 43, Ill.**

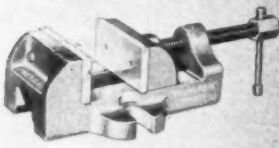


The parts are loaded and properly located by clamps, after which the operator starts the carriage moving into the welding position. As the carriage is positioned, hydraulic valves automatically initiate the welding guns which move into position. The ultra-speed units are started automatically, both moving at once, making four welds at a time. Upon completion of the travel of the ultra-speed units, the guns retract, the fixture moves out of the welding machine, and the operator removes the welded assembly. The new assembly parts are then loaded to commence the new cycle. For additional details and specifications, write:

**The Federal Machine and Welder Co.**  
**Dept. BB**  
**Warren, Ohio**

#### NEW 3" PALMGREN DRILL PRESS VISE


A new 3"-jaw Drill Press Vise, designated as Model No. 320, has recently been added to the Palmgren line of machine vises. The new vise has jaws 3" wide, with a 3" jaw opening, and with a jaw depth of 1½". The jaws are fabricated of steel, and are removable. The new unit is provided with side lugs for convenience in bolting to machine tables. It is recommended for use on drill presses, milling machines, grinders, and similar machines.



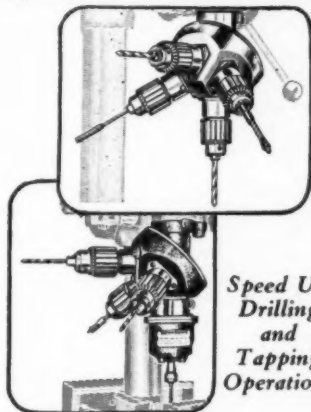
The vise is constructed of precision-machined semi-steel grey iron castings. For complete information and specifications, write:

**Chicago Tool & Engineering Co.**  
**8383 South Chicago Ave., Dept. BB**  
**Chicago 17, Ill.**

**11 HOLES DRILLED**  
**3 DIFFERENT SIZES**  
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**TAPPED**  
**IN**  
**25 SECONDS**  
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*Speed Up  
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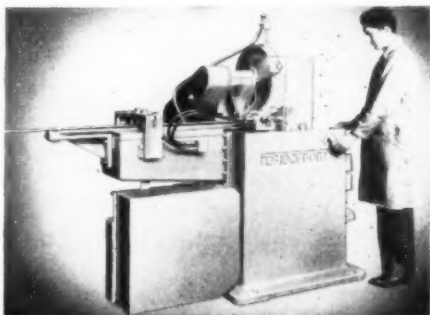
★ You, too, can offset higher wages by getting production costs down! Let QUADRILL (4 position drill head) and QUAD-TAPPER cut your manufacturing costs. Quick as a flash, operator indexes from one size drill or tap to another. No loss of productive time. No need to move part from one station to another. Write today for literature and prices.

**CHICAGO**  
**DRILLLET CORPORATION**  
 1735 N. Winchester Ave., Chicago 22, Ill.

## BRIDGEPORT AUTOMATIC ABRASIVE CUT-OFF MACHINE

Fully automatic operation, high production rate, and cuts held to close tolerances are among the features of the Model 51, a new abrasive cut-off machine announced by the Bridgeport Safety Emery Wheel Co. The unit is designed for high speed cut-off of stock up to 2" square, in lengths ranging from 1/4" to 12". Steel, brass, plastics, porcelain, and other industrial materials may be cut with speed and precision on this new model 51.

The head assembly, which consists of an 18" abrasive cut-off wheel driven through Vee belts by a 10 h.p. motor is mounted on a rocker shaft running in Timken bearings, and is actuated by a hydraulic cylinder which feeds the wheel in and out of the cut. The hydraulically operated feed mechanism is synchronized with the cutting head, and automatical-



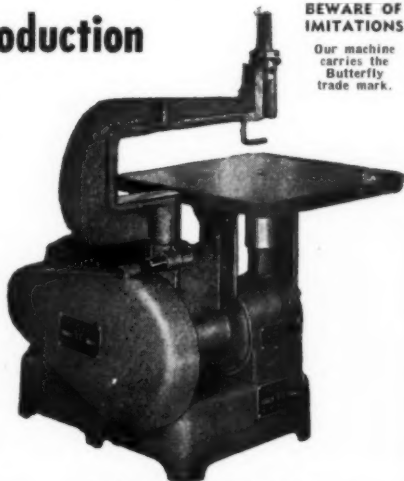
ly feeds a predetermined length of stock into position, where it is gripped by a holding vise. After the cut has been completed, the wheel withdraws, the feeder returns to normal position, and the cycle is repeated automatically until the stock is exhausted, or the

## To Increase Production and to improve efficiency use Butterfly Filing and Die Making Machine

This is a powerful machine, for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models, No. 16, No. 14, "EL" and Model "D". The larger the model, the larger the stroke and therefore more filing is performed, furnished with or without pedestals.

Constructed as per Specification of U.S. Naval Aircraft Factories.

**HARVEY MFG. CORP.**  
161 GRAND ST., NEW YORK  
Phone Canal 6-5170



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Our machine  
carries the  
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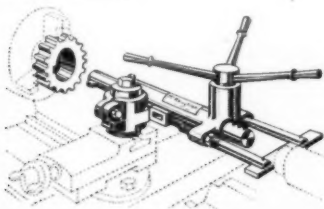
machine is stopped by the operator.

For complete performance data and specifications on this new unit, write: Bridgeport Safety Emery Wheel Co. Dept. BB Stratford, Conn.

#### McNAUGHTON KEYSEATER USEFUL LATHE ATTACHMENT

The McNaughton Keyseater, a manually operated keyseating attachment for lathes, is a sturdy and useful device which is supplied with a complete set of cutters of high speed steel, from  $\frac{1}{8}$ " to  $\frac{3}{4}$ ", as standard equipment. Cutters from  $\frac{1}{8}$ " to  $\frac{1}{4}$ " are in 32nd-inch graduations; those from  $\frac{1}{4}$ " to  $\frac{9}{16}$ " are by  $\frac{1}{16}$ th-inches, permitting any size keyway within the range to be cut with precision.

The steel spindle of the keyseater is equipped with a No. 4 Morse taper hole, heavy rack teeth, and is ground finished. The device can be placed on the lathe and removed as easily as making a tool change. By clamping the carriage and taking the end thrust against the tailstock, the Keyseater has absolute solidity.



Grooves and keyways of almost any shape may be effected by using suitable cutters. Blind bores, either straight or taper, can be keyseated to a bottom, by drilling a hole through the work for the cutter to clear into. It is also claimed by the manufacturers that small taper holes can be bored with the McNaughton Keyseater more easily than feeding with a compound, and can be keyseated at the same set-up. For additional details, write to the national distributors:

Deaderick Machinery Co., Dept. BB  
608 Sevier Ave.  
Knoxville, Tenn.



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BLADES



POWER  
BLADES

BAND SAWS  
(Metal Cutting, including Skip-tooth)

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Makers of hand and power hacksaw blades,  
files, metal cutting band saw blades and  
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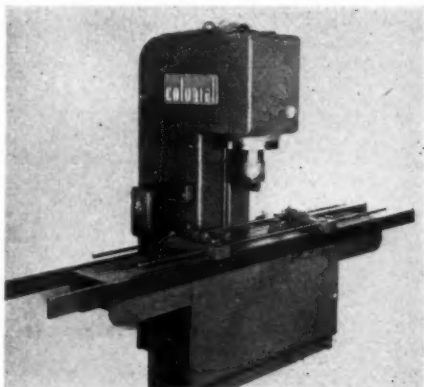
## 75-TON CAPACITY COLONIAL STRAIGHTENING PRESS

A new and larger 75-ton model has been added to its line of 15, 20, 35, and 50-ton hydraulic straightening presses by Colonial Broach Co. Designed for handling both finished and rough work, the new No. PS-75-12 employs a double rail straightening fixture to take care of the larger and heavier work for which this high capacity press is designed.

Rugged reinforced welded steel construction is used for the open side frame design. The motors are built-in. Rams are direct acting from high capacity hydraulic cylinders mounted in the head, and are available with bronze ram noses in place of the standard steel design, if desired. The same is true of work support anvils. Work supports may be either center or roller type depending on the nature of the work to be handled. Guide rails are extra long to prevent sagging of long work beyond the work anvils.

Standard equipment includes hand controls and pressure gage. Foot pedal operation is also available as special equipment.

The space is 54" by 140" including the straightening fixture. Stroke of the ram

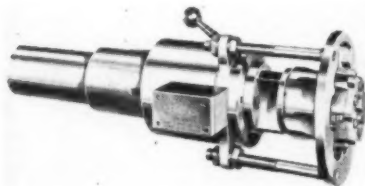


is 12", with a power stroke speed of 45" per minute and a return speed of twice this amount. The hydraulic system is operated through a 15 h.p., 1800 r.p.m. motor. For complete specifications and performance data, write to the manufacturer:

**Colonial Broach Co., Dept. BB  
P.O. Box 37, Harper Station  
Detroit, Mich.**

## LANDIS RECEDING CHASER COLLAPSIBLE TAPS

An improved tap, the Style LL Receding Chaser Collapsible Tap, designed primarily for tapping tapered threads has been developed. It is adjustable



for thread length and can be used for American Tapered Threads or for any line pipe, tubing, casing, or drill pipe thread, listed in the A.P.I. Standards,

providing that these threads are within the diametrical capacity of the taps.

All operating parts are steel. Those parts subject to wear which may affect accuracy are heat treated or hardened, and precision ground. The taps are of sturdy construction with a rigid chaser support. The receding action of the chasers is accomplished through a fulcrumed lever principle.

The collapsing action of the tap causes the chasers to drop into the tap head, at the completion of the thread, freeing the chasers from the work and permitting the direct removal of the tap without reversing it or "backing out".

An outstanding feature is the detachable head which permits the use of tap heads of various sizes and capacities on

the same tap body. This makes it possible to cover a wide range of thread sizes with a minimum amount of equipment, thereby reducing installation cost.

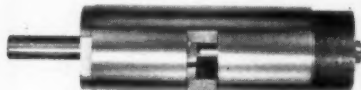
Landis Style LL Taps may be used as stationary or rotary taps and are convertible. Left hand threads can be cut by using left hand Style LM tap heads with the left hand chip clearance and left hand chasers. The Style LL Tap Body is made in four sizes to cover a range of nominal pipe sizes from 1" to and including 12". For complete details, write:

Landis Machine Co., Dept. BB  
Waynesboro, Pa.

#### NEW STOCK PUSHER ELIMINATES ROD SCARRING

This new type of stock pusher is designed primarily to eliminate the scarring of the rod when it is being retracted from the screw machine. This device provides a positive forward feed of the rod without scarring the surface and allows the pusher to be retracted with a minimum of stress.

The device works on a reverse taper principle. A set of smooth-faced jaws is held in light frictional contact with the rod by a circular spring. The outer surface of the jaws is tapered to match a corresponding taper in the holder.



When the pusher is moved forward, the jaws are squeezed against the stock. The clamping pressure increases as resistance is encountered. When the pusher is retracted, the taper releases the jaws instantly and allows them to slide freely when urged by the retainer. These pushers can be made for any standard screw machine. For further information, write:

T. H. Lewthwaite Machine Co.,  
Dept. BB, 312 East 47th St.  
New York 17, N. Y.



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30% & 20%  
DISCOUNT

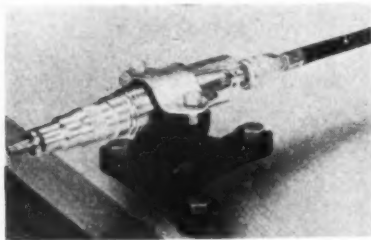


| Diameter<br>Inches | List Price<br>Per Dozen | OUR<br>PRICE |
|--------------------|-------------------------|--------------|
| 1/64               | \$ 4.75                 | \$ 2.38      |
| 1/32               | 3.50                    | 1.96         |
| 3/64               | 2.40                    | 1.35         |
| 1/16               | 3.00                    | 1.68         |
| 5/64               | 3.10                    | 1.74         |
| 3/32               | 3.20                    | 1.80         |
| 7/64               | 3.40                    | 1.91         |
| 1/8                | 3.60                    | 2.02         |
| 9/64               | 3.90                    | 2.19         |
| 5/32               | 4.20                    | 2.36         |
| 11/64              | 4.50                    | 2.52         |
| 3/16               | 4.85                    | 2.72         |
| 13/64              | 5.25                    | 2.94         |
| 7/32               | 5.75                    | 3.22         |
| 15/64              | 6.25                    | 3.50         |
| 1/4                | 6.75                    | 3.78         |
| 17/64              | 7.50                    | 4.20         |
| 9/32               | 8.25                    | 4.62         |
| 19/64              | 9.00                    | 5.04         |
| 5/16               | 9.75                    | 5.46         |
| 21/64              | 10.75                   | 6.02         |
| 11/32              | 11.75                   | 6.58         |
| 23/64              | 12.75                   | 7.14         |
| 3/8                | 13.75                   | 7.70         |
| 25/64              | 15.00                   | 8.40         |
| 13/32              | 16.25                   | 9.10         |
| 27/64              | 17.50                   | 9.80         |
| 7/16               | 18.75                   | 10.50        |
| 29/64              | 20.00                   | 11.20        |
| 15/32              | 21.25                   | 11.90        |
| 31/64              | 22.75                   | 12.74        |
| 1/2                | 24.25                   | 13.58        |

**EASTERN Tool Supply Co., Inc.**  
174 Grand St., New York 13, N. Y.

### ARO MOUNTING FIXTURE FOR PORTABLE TOOLS

A new tool mounting fixture, Model 7101, for all types of portable tools, is announced by the Aro Equipment Corp. The fixture is suited to many jobs where it is more practical to bring



the operation to the tool. This mounting device is adjustable to any position. In many applications, production can be greatly increased, since the operator has use of both hands.

The fixture will accommodate tools from small size drills, grinders, screw

drivers, etc., up to a large  $\frac{1}{2}$ " drill. It is also suited for all electric tools. Many grinding and burring jobs can be handled faster and easier with the grinder clamped in a fixed position. Drilling and reaming jobs, rotary file work, and numerous other production jobs can be handled with a saving in time and labor by use of this fixture, according to the manufacturer.

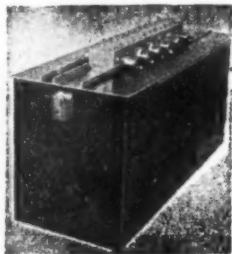
The unit is ruggedly built for production applications. All adjustments can be made with standard end wrenches. The device is furnished with lag bolts for bench mounting and pad for tool. For complete details write:

**Aro Equipment Corp., Dept. BB  
Bryan, Ohio**

### DO-ALL BENCH FILE WITH VARIABLE SPEED ATTACHMENT

Infinitely variable speed in a Precision Die Filer is a recent development of the DoAll Co., designated as the All-American Model 1500-S. Stepless speeds from 170 to 470 strokes per minute are made possible through the use of DoAll

### ROLL FORMING MACHINES AND ROLLER DIES



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery—

Your inquiries invited.

**Maplewood Machinery Co.**

**2634 Fullerton Ave. Chicago, Illinois**

### DIE SHEARING PRESS

- for Cold Heading Shops, Jewelry—  
a must for every tool and die shop

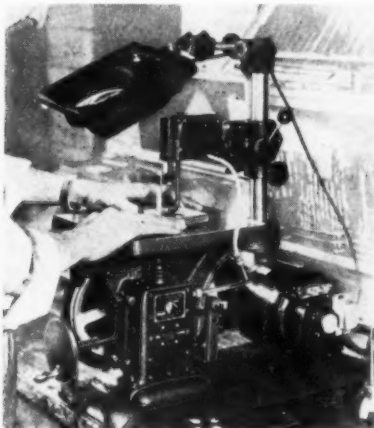


Simplifies making male or female dies — in one fourth the time required by usual methods. Used for die tryout, blanking, forming, embossing, and hobbing. Write for descriptive folder. Capacities to 1,000 tons.

**M & N Machine Tool Works, Inc.**  
156 Orene St. Clifton, N. J.

Speedmaster, Model No. 3A. This means faster cutting and longer tool life, whether the machine is used for filing, sawing, or honing, in a complete range of materials. Speed changes are accomplished by turning a hand wheel, located at the front of the machine.

This type of machine is useful for work requiring high accuracy and work too intricate to be finished on a band filer. The files are available in 12 different shapes, three grades of coarseness, and two shank sizes, with corresponding cross-section sizes. For finishing work after dies are hardened, honing stones are available with either flat or radius cutting surfaces. Also available are diamond hones, for finishing carbides and metals harder than 65-C Rockwell.



Features include a universal-joint file clamp to assure vertical file position, vertical slide bearings adjustable from the outside of the machine, air jet chip removal, and screw-operated tilting table, 10 $\frac{3}{4}$ " square, with register pin for perfect 90° setting.

For further information on this machine, write for Bulletin 548 to:

**The DoAll Co., Dept. BB**  
254 N. Laurel Ave.  
Des Plaines, Ill.



***haskins***  
**FIRST...**  
***if you want***  
***tools that LAST!***



These days, the lasting quality of Haskins Flexible Shaft machines is minimizing production difficulties and delays wherever they're at work. Many 20-

year-old Haskins portable tools are still on the job; and their usefulness covers everything from die polishing and buffing to heavy duty sanding and rotary filing!

It's an asset, this Haskins quality—an asset that stands ready to help you.



Send for full information.  
**R. G. HASKINS COMPANY,**  
2645 W. Harrison St.,  
Chicago 12, Illinois.

***haskins***  
**FLEXIBLE SHAFT EQUIPMENT**



## ARTUS ARBOR SPACERS

The COLOR tells the THICKNESS

ARTUS Arbor Spacers made of plastic in various colors identify thickness at a glance! .001, .0015, .002, .003, .005, .0075, .010-.030. Speed up accurate fitting at low cost.



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Handy Spacer Assortment

10 ea. .001 — .0125 thick  
5 ea. .015 — .030 thick

100 SPACERS IN ALL

$\frac{7}{8}$ " — \$3.10  $1\frac{1}{4}$ " — \$3.80  
1" — 3.35  $1\frac{1}{2}$ " — 4.70

Other standard sizes also available.

## ARTUS PLASTIC SHIM



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FEELER  
GAUGE  
STOCK

The COLOR  
tells the  
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• Each thickness a distinctive, easy to identify color. Impervious to oil. Long lasting 5"x20" sheets. Special sizes to order. Handy assortment, shim stock, 12 colors—12 thicknesses (.001-.030). Bound together..... \$4.25

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Gentlemen:

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NAME .....

COMPANY .....

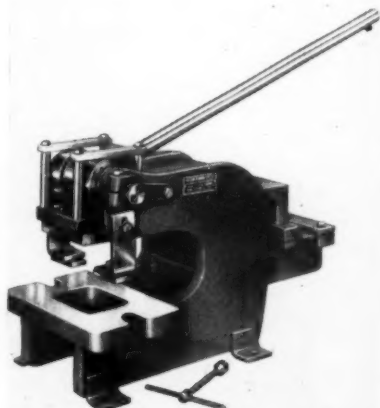
STREET .....

CITY ..... STATE .....

## HAND PUNCH PRESS HAS POSITIVE ALIGNMENT

The Leslie Welding Co., announces a newly redesigned press, Model A, with no ram, ways, or slides, yet with the accuracy of a leader pin die set. All steel and welded construction, it is especially adapted to blanking operations on sheets of any type material. It is claimed that the large capacity of the Leslie Press together with the positive alignment feature make it practical for use in blanking operations which would ordinarily call for power press set-ups.

Positive die alignment is maintained by the aligning leaf assembly, to one end of which the punch is fastened. The other end of the aligning leaf assembly is attached to the press frame by means of a flat spring serving as a pivot when punch is raised and lowered. Because



of the rigidity of the leaf assembly, except at its flexing point, and crank-shaft construction that applies pressure to the leaf at two widely separated points, as in a double crank press, it is unnecessary to center the load on the punch plate.

Designed to accommodate most blanking punches ordinarily used on small power presses, the punch plate is



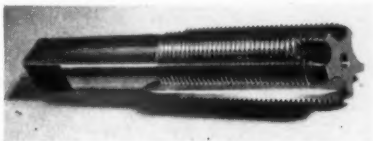
4", front to back, and 4 3/8", right to left. The press has a throat depth of 6", a stroke of 7/16" with adjustment of 1/8". Press capacity is 3" dia. hole through 16 ga. mild steel or 2" dia. hole through 12 ga. mild steel. For further information, write:

**Leslie Welding Co., Dept. PP**  
2943 Carroll Ave.  
Chicago 12, Ill.

#### NEW DESIGN TAP STANDS UP UNDER 500,000 TAPPINGS

Developed to meet a war-time problem encountered in tapping aluminum fuses, a new long-life tap has been announced by W. B. Johnson, former night superintendent at Bastian-Blessing Co., Chicago. The new tool was used successfully in the above plant for over two years. One tap is said to have made as many as 500,000 tappings in aluminum, and another the same number in brass. In steel, cast iron, and copper, the amount of tappings has been from 5000 to 7000 per tap, depending upon the hardness of the metal.

The tap's strength and longevity are accounted for by the device's construction. The wide land of the tap acts as a lead screw, serving to hold size in the tapping, and also giving a burnishing effect. The tap can be sharpened the same as a standard tap; this is made

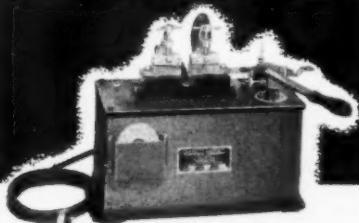


possible by the short flute at the end of the wide land. The tap can be ground the entire length of the flute, and will still hold its size.

The tap is fully covered by patent, and is offered for sale outright or on a royalty basis.

**W. B. Johnson, Dept. BB**  
315 Naperville St.  
Wheaton, Ill.

#### Weldex Bandsaw Welder



Flash welds blades up to 3/4". Ideal for intermittent wire butt welding applications. Eliminates joint preparation and "special flux". Instantly burns off surface irregularities.

5 weld stations, 1 anneal station. 110 and 220 volt models. For details write

## Weldex Int.

7325 McDonald Detroit 10, Mich.

# Micro

*Supreme*

## LAY-OUT AND IDENTIFICATION DYE

**12 COLORS\***

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of stock and parts . . . Shows up in sharp relief—dries instantly—easily removed . . . Write for circular.

\*Purple shipped unless otherwise specified

### MICHIGAN CHROME & CHEMICAL COMPANY

6340 E. Jefferson Ave. • Detroit 7, Mich.

## Faster Tube & Pipe Cutting

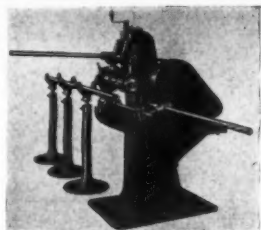
**S**TEEN High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters  $\frac{1}{8}$ " to 3";  $\frac{1}{8}$ " to 6"; 3" to 12".

WRITE FOR CIRCULAR TODAY

**CONTINENTAL MACHINE CO.**

1954 Maud Ave.

Chicago 14, Ill.



## STEEL RETAINER TYPE ROLLER BEARINGS

The Rollway Bearing Company, Inc., announces Tru-Rol, a new precision cylindrical roller bearing with a steel retainer. The new features include Tru-Rol (patent applied for) one-piece steel retainer with pockets having deep, broad, double flanges, in which the rollers are kept in alignment, insuring long life by the correct guiding of the rollers.



Additional bearing components are the outer race, with deep ring grooves in the inside diameter into which fit the heavy snap rings that hold the roller retainer and rollers in the outer

race which make up the roller assembly. The inner race is separate and is interchangeable.

Tru-Rol bearings are manufactured in a range of sizes conforming with S.A.E. standards for roller bearings. Any Tru-Rol bearing can be applied using the inner race, or without the inner race, depending on the application required. Catalog No. 847 is now available upon request, together with a list of sizes now in production.

**Rollway Bearing Co., Inc. Dept. BB**  
Syracuse 1, N. Y.

## DRILL DRIFTS REDESIGNED

The Cleveland Twist Drill Co. announces an important development in drill drifts. Essential equipment in every shop that uses taper shank tools, these drifts are safer and handier than the old style, the manufacturers claim.

The drift has been improved by adding a shoulder, or flange, on the head



### ATLANTIC for GEARS

Our service on small gears, due to new equipment recently installed, will interest you.

Send samples or blueprints for quotation.

**ATLANTIC GEAR WORKS, INC.**  
198 Lafayette St., N. Y. 12, N. Y. Canal 4-1441

*For  
Fast, Accurate  
Metal-Cutting  
Use*



**KENNAMETAL**

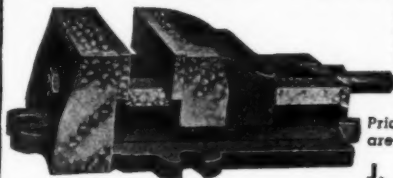
CEMENTED CARBIDE

TOOLS, BLANKS, and MILLING CUTTERS



**KENNAMETAL Inc.**  
LATROBE, PA.

## PLUNKET IMPROVED VISES



We make a complete line of modern vises for drill presses, shapers, milling machines and grinders. Illustration shows our standard drill press vise which may also be used on milling machines.

No. 1-6" jaws, 1½" deep, opens 5" wt. 35 lbs. \$38.00

No. 2-10" jaws, 2¼" deep, opens 8½", wt. 90 lbs. \$55.00

Prices are net f.o.b. Chicago. Dealers' inquiries are solicited. Write for illustrated folder today.

**J. E. PLUNKET MACHINE CO.**  
1823 W. LAKE ST. CHICAGO 12, ILL.

end. Users find that the new drift is less damaging to babbit hammers and that a more solid driving force can be applied to the enlarged end. Mushrooming is lessened due to the added metal at the head.



The enlarged end prevents the drift from flying through the spindle slot, eliminating the danger of someone being hit. Time is saved because it is removed from the spindle slot instead of having to be picked up from the floor or the chip pan. Each drift is furnished with a hole so that it may be chained to the machine or hung on a wall.

Cleveland Twist Drill Co., Dept. BB  
1242 E. 49th St.  
Cleveland 14, Ohio.

## COLOR SIMPLIFIES TOOL STEEL IDENTIFICATION

To give tool and die steel users a more positive method of identifying steels of different grades, the entire surfaces of all matched tool and die steel bars are now being painted different, distinctive colors, it was recently announced by The Carpenter Steel Co.

Twelve different colors identify steels in the Air-Hardening, Oil-Hardening, Water-Hardening, and Red-Hard Matched Sets. Formerly, even though bars were plainly labeled, and painted on each end, there were still many cases of lost identity when both ends of the bars were removed. Now users of the completely-painted bars claim that the marking program makes identification certain, helps eliminate confusion in stocking, and simplifies inventory taking. Write for complete details to:

The Carpenter Steel Co.  
Dept. BB  
Reading, Pa.

*Only turner*  
**PLASTIC HAMMERS**  
give you *all* these features!



## A QUALITY HAMMER

Recommended by thousands of  
Machinists . . . Metal Workers . . .  
Mechanics . . . and Tinsmiths

(Ask your tool jobber or write)

**MATTICKS MANUFACTURING CO.**

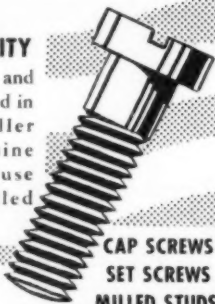
*Specialists in Plastic Hammers*

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## CONCENTRICITY

of head, body and thread is assured in every Ottemiller Screw Machine Product because they're "milled from the bar."



CAP SCREWS  
SET SCREWS  
MILLED STUDS  
COUPLING  
BOLTS

PRECISION MILLED BY

WILLIAM H. CO  
*Ottemiller*

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## SCHAUER SPEED LATHES CUT PRODUCTION COSTS

Users report Schauer Speed Lathes reduce finishing costs 50% to 90%!

They lap, de-burr, polish, finish small metal and plastic parts faster, better, and at far lower cost.



Write for  
Catalog  
440

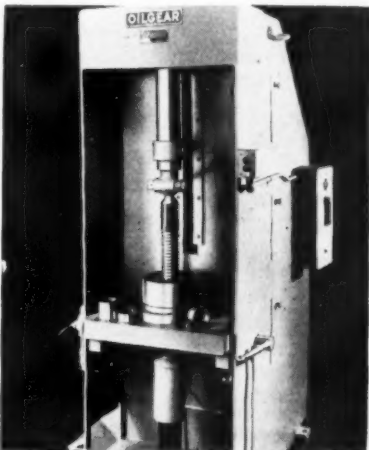
**THE SCHAUER MACHINE CO.**

Originators of today's Speed Lathes

2064 Reading Road Cincinnati 2, Ohio

## 15-TON OILGEAR SIDEPLATE PRESS

Up to thirty internal 10° helical oil grooves are broached in one pass in 3" bore and other sizes of SAE 64 bronze connecting rod piston pin bushings for large diesel engines on this Oilgear 15-Ton Sideplate Press. Production at 85% efficiency is 125 finished bushings per



hour. Other 10° helical grooves 1/32" wide x 1/32" deep are also broached in the lower half only of large bushings.

In operation, the bushing is loaded in fixture pocket and supported on a thrust bearing. As the tool is pushed downward to broach grooves, the lead on the tool causes part to rotate. When bushing is broached, the positive tool holder on the ram is released and the air cylinder lowers the tool. The press ram returns to starting position. As tool is lifted by the air cylinder, the detents on tool shank lift the bushing out of the fixture for easy removal. The finished part is lifted from the tool shank. The press ram moves down to engage the positive tool holder, and lifts the tool to starting position. Air valve is mounted on left side of press frame.

The stroke of the unit is 30"; daylight

opening is 36"; table height, 36". The broaching speed is variable up to 195" per minute; the return speed is variable up to 385" per minute. For complete specifications, write:

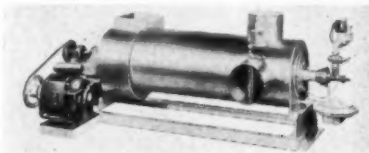
**The Oilgear Co., Dept. BB**  
1301-1417 W. Bruce St.  
Milwaukee 4, Wis.

#### NEW INDUSTRIAL HEATER UNIT PACKAGE

The Midget Utility Air Heater with improved design features is now available as a complete package unit, Gas Appliance Service Inc., has announced. The "package" includes, in addition to the heater, a fan, motor, drive, safety devices, and temperature control.

Since it is useful for heating drying rooms and small industrial ovens, this unit has a large number of industrial applications, including baking lacquers and enamels on metal, baking varnish on coils and armatures, curing rubber products, and the drying of various materials.

With a heating capacity of 125,000 B.T.U. per hour, the heater is suitable for temperatures up to 350° F. The bricklined combustion chamber affords complete combustion of gas. The fan capacity is 1000 cu. ft. of air per minute; hot air can be recirculated for greater fuel economy. Both the burner



output and air volume can be regulated for progressive temperature control and air circulation. Further information on this unit may be obtained from:

**Gas Appliance Service, Inc., Dept. BB**  
1211 Webster Ave.  
Chicago 14, Ill.

*Fast but accurate*

## **Littell ROLL FEEDS**

**Style "M"**



Simplify work for your die setters and press operators. Get easy-to-install Style "M" Roll Feeds. All the features of higher priced feeds. Positive, silent roller drive gives high speed with exceptional accuracy. One of many fine Littell pressroom machines.

REQUEST BULLETIN

**F. J. LITTELL MACHINE CO.**  
4153 RAVENSWOOD AVE., CHICAGO 13, ILL.

*Hammond*  
OF KALAMAZOO

Model "400"

**HORIZONTAL or VERTICAL**



**4" ABRASIVE BELT GRINDER**

Eliminate costly hand filing, grinding, deburring and many other operations . . . There are "101" applications for the 400 in your plant. Write for bulletin.

*Hammond Machine Builders*

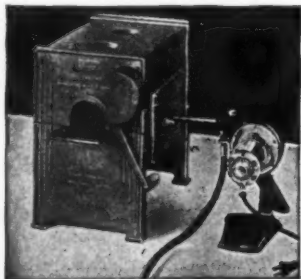
1614 Douglas Avenue • Kalamazoo 54, Michigan

# **"Stark"**

## **"ELECTROBLAST"**

### **High Speed Muffle Furnace**

**attains high speed heat  
in 20 minutes**



**No. 1 Furnace, as shown, muffle opening 7 x 3 1/8 x 2 1/8" complete with independent blower or torch and metal gas hose. . . . . \$80**

**No. 2 Furnace, muffle opening 7x4 5/8x3 1/2" with built-in blower & gas hose. \$148.**

**Operate on city or tank gas for 7 to 10 cents per hour.**

**Built of best materials, they do high grade small work handily and efficiently**

**Adequate pyrometer equipment extra, if desired.**

*Write to us*

**Stark Tool Company**

Established 1862

**WALTHAM, MASSACHUSETTS**

*Originators of the American Bench Lathe*

### **HEAVY DUTY FILING AND SAWING MACHINE**

The "Butterfly" Filing and Sawing Machine is a powerful unit designed for extra duty operation in aircraft, automobile, and other industrial plants, which require heavy precision filing and sawing jobs. The unit acquired its name "Butterfly" due to its nearly noiseless running. The model No. 16,



illustrated, is equipped with a surface table 16" square which tilts in two directions, 10° each way. Provision is made for attaching a screw feed sawing attachment. The machine's capacity from the center of the table to the inside wall of the overarm is 12".

The Model No. 16 is provided with a large, two-jawed chuck, 2 3/4" in diameter. A sturdy 1 3/8" reciprocating ram, of hollow steel, ground, is provided. A dust-proof steel plate is attached at the bottom so that the dust from filings will not enter the housing.

The unit has a speed of from 380 to 500 strokes per minute; stroke is about 2", therefore performs more filing per stroke than smaller machines. It is powered by a dual-speed, V-belt drive electric motor, either 1/3 or 1/2 h.p., either a.c. or d.c., single phase, 110/220

volts, 1725 r.p.m. The machine occupies a bench space of 22" x 25".

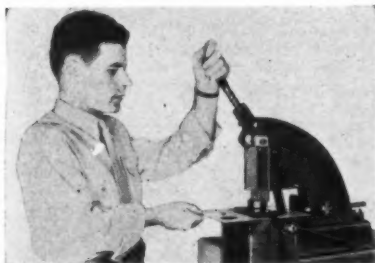
The "Butterfly" Filing and Sawing Machine is used by such firms as the R.C.A. Mfg. Co., Eastman Kodak Co., Bendix Aviation Corp., and many others. It is also used in such educational institutions as Cornell University, Harvard, and M.I.T. for research work. For complete operational details, write the manufacturer:

**Harvey Manufacturing Corp.,**  
161 Grand St., Dept. BB  
New York, N. Y.

#### **O'NEIL-IRWIN DI-ACRO PUNCH**

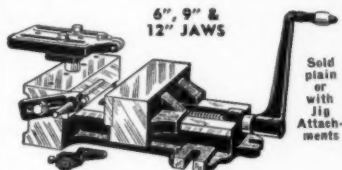
The new Di-Acro Punch is a double purpose machine for perforating holes of various shapes and sizes up to 4" in diameter, and also for use as a precision punch press for a variety of blanking, drawing, embossing, and forming operations. The action of this unit is obtained through a roller bearing cam which converts a small degree of operator effort into a tremendous pressure at the point of impact.

A feature of the Di-Acro Punch is its triangular shaped ram, hardened and precision ground for accuracy; this controls the position of the punch head, assuring exact alignment, since the ram cannot turn or twist.



The flexible gauging arrangement built into the punch can be adjusted to provide precision location of the material for exacting operations. A variety of interchangeable punches in round, square, oval, and rectangular shapes is available, making the unit useful both

## **You'll find 1,000 uses for this Vise!**



#### **GRAHAM MULTI-PURPOSE VISE**

In 3 sizes up to 124 lbs., this vise serves innumerable purposes where a jig or fixture would otherwise have to be specially made. Available attachments include stops, guides, U-jaws, shell jaws, bushings, etc., for accurate repeat-operation positioning of thousands of different shapes.



Request Bulletin 41

#### **"Adjust-angle" KNURL HOLDER**

Many patterns  
using only  
straight knurls



On work up to 2 1/2" dia., this Knurl Tool produces a variety of straight, spiral and diamond patterns, using only straight knurls. Shank made to fit your turret (or lathe tailstock). Equipped with passing-over-stock feature if desired. Graduated adjustment of knurl angle.

For prices and details request Bulletin 41

**Graham Mfg. Co.**

52 Bridge St. East Greenwich, R. I.



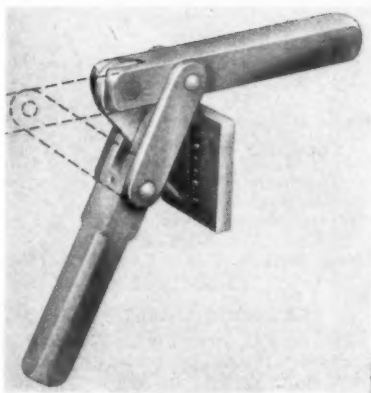
for experimental work and production operations.

The throat height is 3-13/16"; throat depth is 6 1/4". The bed dimensions are 8" x 7 1/2". The net weight of the unit is 175 lbs. For complete information on the new Di-Acro Punch, write:

O'Neil-Irwin Mfg. Co., Dept. BB  
314 Eighth Ave.  
Lake City, Minn.

#### THAYER FAST-ACTING CLAMPS

A newly developed device which is causing considerable interest in the plants where it has been tested is the Thayer Clamp. This unit is a fast-action tool which is precision built for heavy duty work. The hold down arm and handle are fabricated of 1" square stock; 7 1/2" overall bushings are hardened to insure longer life. The handle is in down position whether the device is in locked or unlocked position. The unit features clearance for fast loading and unloading. The clamp is made either for side or top mounting.



Full size template sheets will be sent upon request to the manufacturer:

C. E. Thayer Machine & Mfg. Co.  
307 Bird Ave., Dept. BB  
Jackson, Mich.



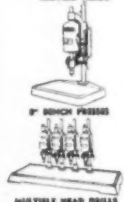
VARIABLE SPEED MOTORS



FLEXIBLE SHAFT UNITS



AIR-FED HEAD



MULTIPLE HEAD DRILLS

## Speed-Right

### INSTANT-SET STEPLESS VARIABLE SPEED

The SPEED-RIGHT FLEXIBLE SHAFT for midget mills, rotary files and grinding wheels will not slow down when put to work. The RIGHT SPEED allows rotary files and burrs to really bite into the stock without chatter or overheating, and provides high speeds for uniform grinding and polishing.

Any required rpm can be instantly set at the finger-tip governor speed control lever. The result is a tool that is smooth and steady on the work with greatly increased tool life and production.

Handpieces for every job—Small Pencil type—Heavy Duty Ball Bearing Chuck type—Reciprocal Filing—Hammer hand-piece.

1/10 H.P. hang-up or bench type SPEED-RIGHT GOVERNOR CONTROLLED MOTOR.

FROM  
1000—10,000  
TO  
2500—15,000  
R.P.M.



Write for Bulletin 205  
The Electro-Mechano Co.  
261 EAST ERIE STREET  
Milwaukee 2, Wisconsin



# Libert **Hi-Speed** SHEAR

CIRCLE CUTTING  
ATTACHMENT  
Included as  
STANDARD EQUIPMENT  
with this Machine



**MODEL  
1236**

36-in. throat.  
12-gauge  
capacity.

**WRITE FOR  
BULLETIN**

**SIMPLIFIES Maintenance  
SPEEDS Production  
SAVES Manpower**

The *Libert* has amply proved its advantages by turning out top production—shearing flat or formed sheet metal, internal or external, plain or irregular shapes *rapidly, accurately, cleanly!*

Equally effective in maintenance work, *Libert* is cutting costs to rock bottom. Edges are smooth, need no finishing. Unskilled operators produce accurate work at once.

Sizes up to 60-in. throat, 10-gauge capacity.

**LIBERT MACHINE COMPANY**  
Green Bay, Wisconsin

## Dependable MEASURING & CHECKING EQUIPMENT

*Ready to Deliver*

**STRAIGHT and OFFSET TYPE HAND WHEELS**



**STANDARD CAST IRON HAND KNOBS**



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**MALLEABLE IRON LEVERS**

**MACHINE HANDLES**

We also build jigs, fixtures, special tools and machinery. Send us your blueprints.



**UNIVERSAL ANGLES**  
In 10 sizes, ranging from  
4 x 3 1/4 x 5 and up.

**BOX PARALLELS**

In 15 sizes, ranging from  
3 x 4 x 12 and up.

**SLOTTED ANGLES**

In 19 sizes, ranging from  
4 x 9 x 5 and up.



**SURFACE PLATES**

Over 50 sizes, ranging from  
7 x 7 1/2 to 96 x 192.

Send for Complete Catalog

**MACHINE PRODUCTS CORPORATION**

6771 E. McNICHOLS ROAD

DETROIT 12, MICHIGAN

### OIL-RITE FLOW SIGHTS

Oil-Rite announces a new Flow Sight, Style SFX, as a companion to their Sight Feed Valves. This unit permits maximum visibility, assuring dependable visual inspection of the flow of liquids from a distance. It is often used at elevated heights, showing at a glance the flow as well as the clarity of the liquid.

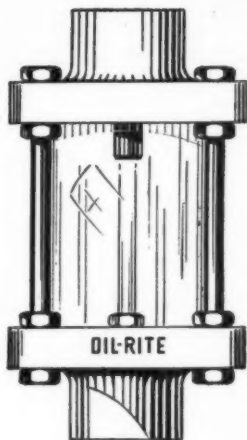
Flow Sights SFX are used for gravity or pressure fed lines with flow of liquid downward through a nozzle on the inlet side. Suitable for moving large quantities of liquid, the round stream observed is discharged without contacting the transparent sight. Flow control can be obtained by adding a regular globe, angle, or gate valve.

The unit is light in weight because of its aluminum alloy top and bottom plates which carry the transparent sight cylinder between two cork gaskets. The drip nozzle can be provided with an orifice depending upon individual conditions and usually ranges from  $\frac{1}{8}$ " to  $\frac{9}{16}$ " diameter. Sight cylinders are furnished in Lucite. For applications where the temperature exceeds 150° F., glass can be supplied.

Available in three body sizes having sight diameters of  $1\frac{1}{2}$ ", 2", and  $2\frac{1}{2}$ ", with either  $\frac{1}{8}$ ",  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", or 1" female pipe threads. Complete details for all applications will be fur-

nished by:

**Oil-Rite Corp., Dept. BB**  
3474 S. 13th St.  
Milwaukee 7, Wis.



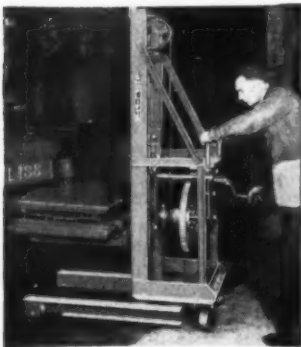
### HEAVY DUTY PORTABLE SHOP ELEVATORS

Two new heavy duty portable elevators, the Economy Shoplifters, are announced by the Economy Engineering Co. They are designated as the Type DX Heavy Duty Shoplifter, and are made in

two capacities, 1000 and 2000 lbs.

Features include a heavy steel framework, all welded construction, and two new ball bearing hand power hoist units. These are of the crank up and crank down type and include an automatic holding brake that does not require manual setting or releasing by the operator, a safety ratchet and pawl that also automatically hold the load, and the liberal use of ball bearings to achieve minimum friction. Under the full rated capacity loads, these units require a crank handle pressure of approximately 20 lbs. to elevate or lower a load.

Overall framework dimensions for both capacities are identical, but the heavier unit has reinforcing members. The overall dimensions of the framework will allow the elevators to pass through any doorway that is 6' 8" high x 25" wide or larger. The narrow frame



and platform width, 24", allows these machines to enter narrow aisles and between closely spaced machines.

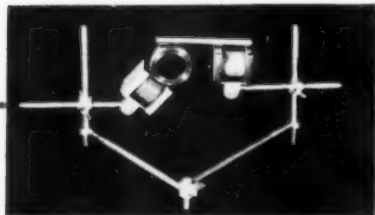
For complete specifications and technical data, write:

**The Economy Engineering Co.,**  
Dept. BB, 2635 W. Van Buren St.  
Chicago, Ill.

#### **DUMONT MAGNETIC WELDING POSITIONER**

Designed for saving time and trouble when welding small parts or pieces this new Welding Positioner consists of a simple, sturdy "V" frame equipped with two permanent Alnico magnets.

Two or more pieces of ferrous metal are gripped and held in virtually any position, ready for welding, soldering or other joining operations. In the picture the Positioner is holding a 3" collar and  $\frac{5}{8}$ " shaft. The magnets are 2" x 2" x  $2\frac{1}{8}$ " with equal holding power on all four sides. They are mounted universally on the frame which has two horizontal arms, 10" long, and two vertical arms, 6" long. The distance between the arms is readily varied as is the height on the vertical arms. The frame has a spread of 18 inches. A ground clamp may be attached to a metal pad at the pivot point of the frame.



A small auxiliary chuck is supplied with the Positioner for holding pieces that present exceedingly small surface areas.

For complete information on the "Minute Man" Magnetic Welding Positioner:

**The du Mont Corp., Dept. BB**  
Greenfield, Mass.

## **Drill-Cut-Chip**

**Concrete and Masonry**

# **10 Times as Fast**

with

## **SYNTRON**

DEPENDABLE

# **ELECTRIC HAMMERS**

### **SAVE MONEY AND TIME**

Drilling Bolt Holes to Anchor Machinery and Shafting.

Cutting Holes for Steam Pipes, Water Pipes and Air Lines.

Channelling for Conduit  
—and a host of other time  
and labor-consuming jobs.

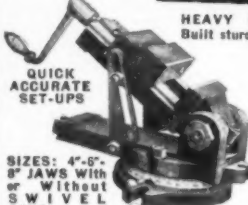
*Illustrated folder on request*

**SYNTRON CO.** 3000 Lexington  
Homer City, Pa.



This

## PALMGREN



QUICK  
ACCURATE  
SET-UPS

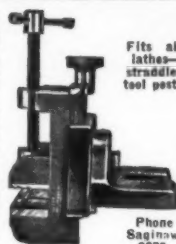
SIZES: 4"-6"  
8" JAWS With  
or Without  
S W I V E L  
BASE.

**HEAVY DUTY ANGLE VISE**  
Built sturdy and rugged for tough, heavy jobs. Adjustable to any angle. Stays locked. Accurately graduated in degrees. Jaws hardened and ground — open full size. Also used horizontally.

Immediate Delivery - Write For Circular 351  
CHICAGO TOOL & ENGINEERING CO.  
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## Combination Can't Be Beat!

No. 250 MILLING  
ATTACHMENT Converts Lathe in 10  
Seconds! Mill, Slot, Grind,  
Groove, Square  
Shafts, Saw at  
Angles, Re-cuts Etc.  
on LATHE, Precision built—90° graduation for rotary  
angle and graduated  
vertical feed screw.



Fits all  
lathes—  
straddles  
tool post.

Phone  
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9675

## IMPROVED HYDRAULIC SHEET FEEDING TABLE

Lyon-Raymond Corp. announces a new design in their standard 10,000 pound capacity portable Hydraulic Sheet Feeding Table, double cylinder type, for which several improvements are claimed. The new unit incorporates the use of two vertical hydraulic cylinders, synchronized by a toggle lever arrangement. Faster and more constant elevating speed is offered, with a lowered table height of 22", and an elevated height of 34".



The table top remains level at all times even under off center loads. Additional lateral support has been obtained for wide platforms, while the

total weight of the unit has been reduced. The dimensions of the standard table include a platform 36" wide by 96" long. The unit is provided with a dual speed foot pump and five feet of hydraulic hose. Two 8-inch diameter Timken Bearing swivel casters, and two 12-inch diameter ball bearing wheels are standard equipment.

Full information regarding the new table can be obtained from:

**Lyon-Raymond Corp., Dept. BB**  
5557 Madison St.  
Greene, N. Y.

## HYDRAULIC RAM TYPE BENDING MACHINE

The Wallace Supplies Mfg. Co. announces a new portable, hydraulic, ram type bending machine, identified as the No. 1402. It utilizes a simplified method of ram bending, with no repositioning of the dies, nor relocating of the pipe when bending up to 180° in one continuous operation.

The unit is equipped with standard die equipment for bending up to 2"

NEW!  
NEW!



no. 2 Morse  
Taper Shafts **\$625** No. 3—\$7.75  
No. 4—\$9.75

## REVOLVING TIP LATHE CENTERS

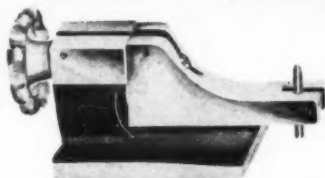
- Lowest Priced Live Center on the Market.
- Rigidity and Concentricity of Dead Center.
- NO BULKY HEADS — Same Dimensions as Solid Centers.
- Yields under load to compensate for work expansion.
- Precision Work due to Long Bearing Surface of Spindle.

Ask Your Dealer for Details

**ERNEST H. VANDERWALL CO.**

440 Golden Gate Ave.  
San Francisco 2, California

## MIGHTY MIDGET RADIUS DRESSER



PUT ONE ON EVERY SURFACE GRINDER

**\$29.00**

Less Diamond

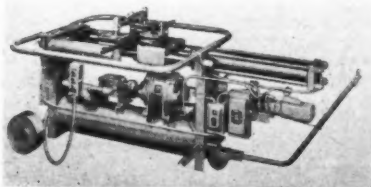
HARDENED SHAFT —  
BEARING ADJUSTABLE  
FOR WEAR.

DIAMOND ALWAYS  
CLAMPED PERFECTLY  
IN PLACE.

ORDER DIRECT OR FROM YOUR DEALER  
ON OUR 10 DAY MONEY BACK GUARANTEE

**SPERMAN METAL SPECIALTIES 2199 E. 21st St., BROOKLYN 29, N. Y.**

steel pipe. Special dies are available for angle iron, channels, etc. Push button controls permit maximum production output. A jog button is provided



to facilitate set-ups or accurate duplications of special parts formed to fit templates. For complete information, write: For Bulletin No. 34, Section K, to:

**Wallace Supplies Mfg. Co., Dept. BB**  
1308 W. Diversey Parkway  
Chicago 14, Ill.

## NEW CUTTING OIL PREVENTS CORROSION

A new high grade cutting fluid, Metal-Clean No. 16, is announced by The Metal-Clean Solvent Corp. The product incorporates super-fatted materials compounded under strict laboratory control, and offers maximum cooling, lubricating, wetting, and rust prevention properties.

The fluid is recommended as a coolant and lubricant for all types of ferrous and non-ferrous metals. It is effective in machining operations involving the use of high speed or carbide tools. Since it is an emulsion, Metal-Clean No. 16 will not separate out of solution; even at high speeds, it will not foam, gum, or suspend foreign matter.

Metal-Clean No. 16 is compounded to prevent corrosion and rust. Besides being easy to use, it is also safe to handle. For complete details:

**The Metal-Clean Solvent Corp.**  
1935 N. Paulina St., Dept. BB  
Chicago, Ill.

## 'STAR DUST'

LABORATORY GRADED  
PURE DIAMOND POWDERS

For GAUGES, TOOLS, DIES, etc., with tremendous TIME SAVING. These factors make STAR DUST indispensable in lapping and superfinishing on HARDSTEELS, TUNGSTEN CARBIDE, CHROME.

- Absolute control of particle sizes
- Complete absence of out-size particles
- STAR DUST sizes as fine as .0001"
- Complete range of grit sizes

There is a STAR DUST Field Serviceman in your territory.

**ACE ABRASIVE LABORATORIES**

ONE SPRUCE STREET  
NEW YORK 7, N. Y.

STAR DUST speeds up production enormously and produces finishes and superfinishes down to less than .0000004 of an inch.

**Precision LAPPING  
POWDERS for  
PRECISION work**



### NORTON FLEXIBLE RESINOID CUT-OFF WHEEL

The development of a new reinforced type of cut-off wheel known as the Norflex wheel has been announced by the Norton Research Laboratories to meet the demand for a wheel that would be tough and hard to break, long-lasting, and with fast cutting qualities. The wheel's design and reinforced construction give it a high safety factor against breakage plus fast cutting action and a low rate of wear.

Operators who have tried the new wheel are enthusiastic over its toughness and safety, features which have been built into the Norflex wheel without any sacrifice of cutting quality. Fast cutting ability is another outstanding property of the wheel. The sides present a file-like surface which enhances the wheel's cutting action. At cutting speeds which reach a maximum of 16,000 f.p.m. at the periphery of the wheel, the concentric rows of molded teeth impart a highly effective cutting action, supplementing the normal cutting action of the sharp cutting points and

edges presented by the Alundum abrasive cutting grains in the periphery of the wheel.

The Norflex Reinforced Wheel is available in 14", 16", and 20" diameters, and in 5/32" and 3/16" thicknesses. For cutting off gates and risers on non-ferrous castings, Norflex wheels in the

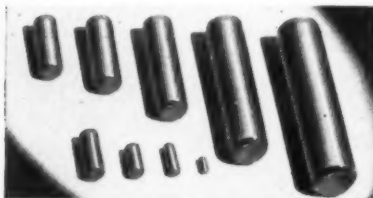


softer of the three available grades are recommended. The 3/16" thick wheels are recommended for unusually severe jobs requiring maximum wheel strength. For complete specifications and technical information, write:

**Norton Co., Dept. BB  
Worcester 6, Mass.**

### HOLO-KROME DOWEL PINS WITH RUSTPROOF FINISH

The Holo-Krome Screw Corp. announces a new product—Holo-Krome Dowel Pins, with a black lustrous finish. This innovation in finishes acts as a lubricant, retards corrosion, and prevents rusting. The lubricity of the Holo-Krome Dowel Pins allows them to



be driven more easily and decreases scoring of pins and mating parts. Made of special analysis alloy steel, these pins are hardened, carburized, and double precision ground. Every dowel

pin is individually inspected. The pins are available from stock in the complete standard ranges of sizes. Specials can be furnished. For complete information, write:

**Holo-Krome Screw Corp., Dept. BB  
31 Brooks St.  
Hartford 10, Conn.**

### PALLET TOWER HANDLES 3000 LB. LOADS

The Truck-Man Pallet Toter has been added to the line of gasoline-powered material handling equipment produced by Truck-Man, Inc. An important feature is the ratio of truck weight (920 lbs.) to pay load, conservatively rated at 3000 lbs. capacity. This will make possible new standards of economy in operation, the manufacturers say. The Pallet Toter is designed around a pneumatic-tired power turret that has been proven in many types of industrial materials handling, a feature which provides turning within its own length. The truck is powered by the "AB"

3 h.p. Wisconsin gasoline engine; the operator rides with the load. Rubber insert load wheels have been designed to soften the jolts, and contribute to smooth entering of the pallet.

Simple operation is stressed by the manufacturer, with all controls, including the brake, incorporated in the sin-



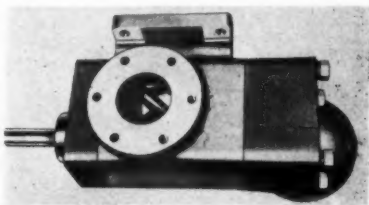
gle transmission lever. Speeds in either direction are from creeping to 3 miles per hour. High efficiency is promised through the gasoline-powered engine

which eliminates the need for auxiliary equipment. For complete information on the Pallet Toter, write:

**Truck-Man, Inc., Dept. BB**  
1391 Ganson St.  
Jackson, Mich.

#### SYNTRON HELICAL ROTOR PUMPS

The Syntron Co. announces a line of positive displacement, helical rotor



pumps. These new units are an axial flow type consisting of only two moving parts, the main, or power rotor, and the gate, or idler rotor. No timing gears are required, since the rotor con-



"...it's the bushing that makes the **wHOLE** difference"

To maintain maximum accuracy in drilling operations, use the bushing that's precision made for the job . . . use Acme! Write for catalog.

**Acme Industrial Company**

Makers of Hardened and Ground Precision Parts  
210 N. Laflin Street • Chicago 7, Illinois

THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS



tours transmit power much in the same manner as a pair of straight gears. The four sleeve bearings are full pressure lubricated by the liquid being pumped. The suction part of the pump can be located in any position relative to the discharge part, and the pump can be either base or flange mounted. The shaft of the driving rotor is mechanically sealed by an "Anti-Friction" Shaft Seal against leakage.

Built in two sizes, these pumps are primarily designed for handling various grades of oils at either 50 or 75 gallons per minute, at pressures of up to 125 p.s.i., in a steady flow. Catalog information is available from the manufacturer upon request.

Syntron Co., Dept. BB  
Homer City, Pa.

#### **TAPER SHANKS ADDED TO CARBIDE DRILL LINE**

Super Tool Co., has added taper shanks to their standard line of carbide tipped twist drills. Taper shanks are now available in the same sizes as

straight shanks,  $\frac{1}{8}$ " to 1" inclusive. This addition is one of the steps taken by Super in completely revising their twist drill setup. Sizes have been added and price changes made to bring the carbide tipped and solid carbide drill picture up to date.



Super's action is a step for which the industry has felt the need, with the growing use of carbide in drilling. New literature is available on request to:

Super Tool Co., Dept. BB  
21650 Hoover Road  
Detroit 13, Mich.



## **The New High Speed Hydraulic Press**

All Castings Meehanite Metal  
For  
Fast Assembly and  
Broaching

*Write For Bulletin 112G*

**GREENERD ARBOR PRESS CO.**  
Nashua, N. H.



### DIE-CUT STAMPED NAME PLATE SIGNS

Under a process originated by the Dayton Rogers Manufacturing Co., it is now possible to get a limited number of die-cut profile custom-made name plates for industrial equipment without the usual die expense. The stamped signs can be produced in any size or style. The maximum overall length is 36", with a letter height up to and including 3". They are usually made of cold rolled strip steel with a finish to blend with the equipment on which they are going to be mounted. They can be made from stainless steel, sheet brass or copper, zinc, and in some cases, sheet synthetic plastic.

The letters should be tied together; the base on many of the name plates can be provided with space for marking the model number, type, and other identification, to coincide with the equipment requirements. They are usually provided with escutcheon pins, metal drive screws, or other means of fastening. Thickness varies from 1/32"



to 1/8". For additional details on these die cut stamped name plates, write:

Dayton Rogers Mfg. Co., Dept. BB  
2849 12th Ave., South  
Minneapolis 7, Minn.



#### COMPLETE RANGE AS FOLLOWS:—

|          |           |           |
|----------|-----------|-----------|
| 6" x 18" | 12" x 36" | 12" x 60" |
| 6" x 36" | 12" x 48" | 12" x 72" |



## SUNDSTRAND MACHINE TOOL COMPANY

2535 Eleventh St. • Rockford, Illinois, U.S.A.

A precision tool for testing and checking parts between centers. Both heads adjustable, locked in place by lever-operated clamps. Work is held between one fixed center while spring loaded retractable center clamps work in position. Dial indicator with adjustable holder available as extra equipment.

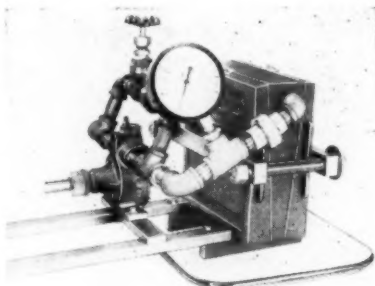
FREE ADDITIONAL DATA covering complete specifications and additional features is contained in this bulletin. Write for your copy today. Ask for data sheet No. 474.

## NEW TEST PRESS FOR FILTERING AND CLARIFYING PROCESSES

The Chemequip Test Press, designed for testing, filtering, and clarifying on small batch work in laboratories and for light production jobs, is announced by the Chemequip Co. Pilot installations of the unit in general chemical plants, and in the pharmaceutical, and paint, lacquer, and varnish fields, have proved most successful. The Chemequip Test Press has several advantages: it is easily set up; only one filter cloth is necessary; slurry feeds directly into the frame, which has 98 square inches of filtering surface.

The press can be easily dismantled and can be taken completely apart in only a few minutes. The rate of filtering for different materials can be tested for various pressures. Liquid is fed through the pump, with a by-pass to control pressure, into the center of the frame. A wedge-shaped cake is formed, which provides means for testing the drying properties of various thick-

nesses. The unit is available in either bronze, or in stainless steel for special



usage. Complete details may be had from:

**The Chemequip Co., Dept. BB  
12 Vernon Ave.  
Newark 8, N. J.**



**SPECIAL MACHINES BUILT TO ORDER**  
We have specialized in building machines and parts to our customers' drawings for 36 years. Send your blueprints for prompt estimates.

## **HARTFORD SUPER-SPACER**

*Special*

## **for JIG BORING WORK**

Here the Super-Spacer is demonstrating another of its advantages to any tool room. Equipped with a face plate for exact location of work, it can be used on your jig borer to save indexing time, and production cost per piece. The Super-Spacer takes milling, drilling, grinding, planing, slotting, boring and other operations in stride. Investigate its benefits to your shop. Write Dept. S7.

**HARTFORD**

*Special*

**THE HARTFORD  
SPECIAL MACHINERY CO.  
HARTFORD 5, CONN.**

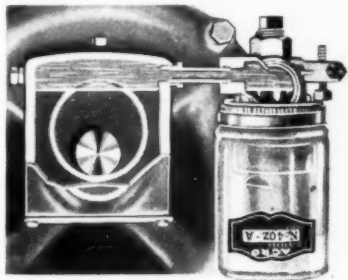
## DUAL VISIBILITY OILER SIMPLIFIES BEARING LUBRICATION

An automatic lubricating device called the Acro Lubricator has been developed by the Acro Metal Stamping Co. The unit simplifies the problem of motor bearing lubrication. It is a small, compact oiler that attaches to electric motors, blowers, shafts, and similar mechanisms requiring a continuous supply of bearing oil. The device contains no floats, valves, nor other moving parts, yet it maintains a constant correct oil level. This automatic, trouble-free feature practically eliminates machine failure due to faulty lubrication.

To set the oil level desired, a simple set-screw permits quick and easy adjustment from the outside of the lubricator. The outstanding feature is the unit's dual visibility. A sight glass on the side of the lubricator bowl shows the exact level of the oil being fed to the bearing. The total oil supply remaining in the reservoir can be seen and checked from a distance.

Acro Lubricators will not drip, over-

flow, or splatter oil, according to the manufacturers, nor will the oil-reservoir jar or vibrate loose. Where manual oiling wastes a high percentage of the oil, the Acro Lubricator utilizes



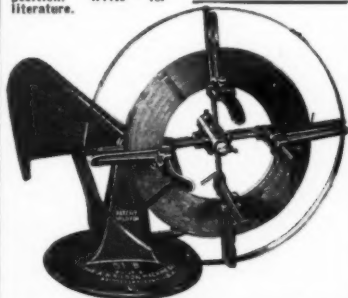
every drop. For complete specifications, write:

Acro Metal Stamping Co., Dept. BB  
1922 N. Buffum St.  
Milwaukee 12, Wis.

## NILSON

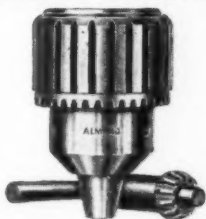
Reel is loaded by one man in less than one minute. . . . Automatic balancer eliminates hand lifting . . . avoids strains and accidents. Locking device automatically locks reel in position. Write for literature.

## WIRE AND RIBBON STOCK REELS \*



**THE A. H. NILSON MACHINE CO.**  
BRIDGEPORT, CONN., U. S. A.

## ALMOND DRILL CHUCKS



Maximum gripping power with  
extreme accuracy and long life.

Write for Catalog

**T. R. ALMOND MFG. CO.**  
ASHBURNHAM, MASS.  
U. S. A.

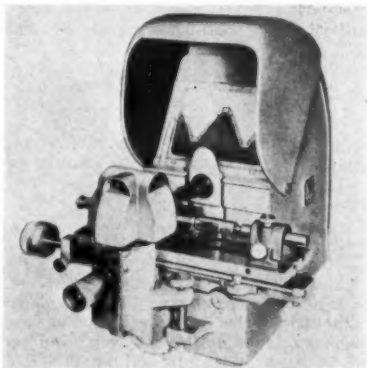
## J & L OPTICAL COMPARATORS OFFER WIDE RANGE OF MAGNIFICATIONS

New Jones & Lamson bench type Optical Comparators and Measuring Machines are available in two basic models with different table assembly combinations. They are designed to cover many fields of inspection work, and offer a wide choice in the selection of a model best suited to individual needs.

The BC-7 Model offers a choice of three table assembly combinations, with a range of magnifications from 5 to 125. The BC-7-A equipped with a 12" plain table is used for comparing the magnified shadow of an object with a master outline. It handles objects up to 3" in diameter. The BC-7-B has a 14" table that can be compounded for inspecting objects with helices. It is used for rapid and accurate inspection by comparison of parts up to 3" in diameter and 11" long between centers.

Equipped for making lateral measurements, the BC-7-C, illustrated, has a 16" table which can be compounded

for inspecting objects with helices. Objects up to 3" in diameter and 11" long between centers can be inspected.

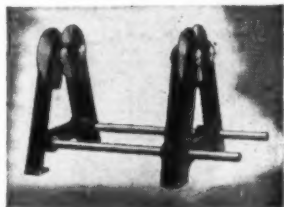


This model is used to inspect a great variety of objects such as hobs, taps,

## If you handle Rotating Parts

If your shop handles rotating parts these sturdy and dependable balancing ways would be highly profitable equipment to use. In accurate balancing and truing operations they save time, labor and money. No leveling required.

Four chilled iron disc rotate with minimum friction on sensitive special bearings, giving a quick, accurate indication of whether or not the work is in perfect balance.



**ANDERSON BALANCING WAYS**

| Swing  | Distance Between Standards | Capacity in lbs. |
|--------|----------------------------|------------------|
| 20 in. | 20 in.                     | 1,000            |
| 40 in. | 30 in.                     | 2,000            |
| 60 in. | 30 in.                     | 2,000            |
| 72 in. | 66 in.                     | 5,000            |
| 96 in. | 88 in.                     | 10,000           |



Write for Bulletin No. 7-5

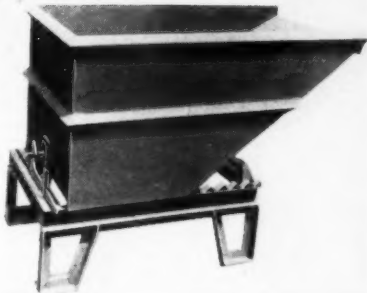
### ANDERSON BROS. MFG. CO., Rockford, Ill.

Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

small tools, threaded parts, calculating machine parts, and others.

The second basic model, the BC-14, equipped with a 14" diameter screen, provides a larger lens field and screen area than the smaller models, and has four table assembly combinations to choose from. For additional specifications, write:

Jones & Lamson Machine Co.  
Dept. BB  
Springfield, Vermont



#### **AUTOMATIC END DUMP FOR LIFT TRUCK**

Designed by the Palmer-Shile Co., this truck is useful for handling and dumping sand, castings, scrap, stampings and other heavy materials. It fits any fork or lift truck. It can be built with rubber or metal wheels instead of legs, and is handy for moving around heavy machinery and through narrow aisles.

Built of heavy steel plate, reinforced with heavy angles, the unit is of all

welded construction. Rockers, geared to the truck, are self-seating and smooth operating. The truck is available in two sizes,  $\frac{1}{2}$  cubic yard and one cubic yard. For further details:

Palmer-Shile Co., Dept. BB  
12648 Mansfield Ave.  
Detroit 27, Mich.

## **NEW POR-MATIC**

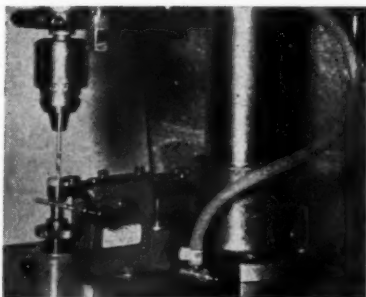
**AIR-OPERATED**

## **DRILLING FIXTURE**

• This new POR-MATIC air-operated Universal drilling fixture is rigid, sturdy and machined to exact tolerances. It will handle round stock  $\frac{1}{16}$ " to 1" and by using a special upper beam or drill bushing carrier  $1 \frac{1}{2}$ " can be received for cross drilling. This fixture can be mounted on any of the regular bench type or floor type drill presses in a matter of minutes. Depending on type of material and diameter of hole size, it will increase production from 33% to 200%.

Price \$75.00 Air Regulator Extra \$8.35

*Send for literature giving complete description.*



*Patent Pending*

## **THE PORTER MACHINE CO.**

3100 ENYART AVE

CINCINNATI 9, OHIO

## FLEXIBLE SHAFT MACHINE FEATURES NEW COUNTERSHAFT MOUNTING

A new and improved Elliott Flexible Shaft Machine, is now in production. Said to be more versatile and efficient than its predecessor, the machine features a new type countershaft mounting spaced well above the motor tilt axis in order to give adequate endwise yielding motion to the flexible shaft as the operator tilts the motor assembly, thereby reducing strain on the workman. The countershaft includes a vertical adjustment operating on a lead-screw principle, with fingertip knob control. With a standard three or four step cone-pulley on the motor shaft, the vertical adjustment is operative through a range of over 4" to provide accurate belt tensioning. By substituting an optional variable pitch pulley for the cone-pulley on the motor shaft, the vertical adjustment provides stepless speed variation through a ratio of over 2:1.

An improved hinged guard equipped with shock mounting swings away from



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**COLWELL 4<sup>in</sup> TURRET**

Make ONE tool set-up and keep going thru FOUR successive operations with NO time lost changing tools. That's how a Colwell works to save time-speed production. Colwell turrets are economical, rugged and accurate. Positive indexing assures working to close tolerances. Sizes for most lathes.

**S.G. COLWELL 25 Congress Ave. Providence, R.I.**

the drive pulley, exposing the parts, as when changing belts. All handpieces, countershafts and motors are of ball-bearing construction, and a ball thrust bearing is used to pivot the welded steel yoke. For complete details on this new unit write:

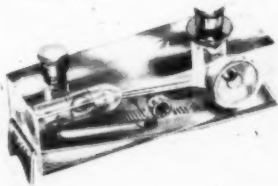
**Elliott Manufacturing Co.**  
**Dept. BB**  
**Binghamton, N. Y.**

#### **DRAFT GAUGE ADDS NEW CIRCULAR LEVEL**

A new feature has been added to the line of transparent draft gauges made by the F. W. Dwyer Manufacturing Co. It is a circular spirit level built into the body of the "Visi-Draft," a highly accurate draft gauge which becomes now a two-in-one instrument. With it, accurate draft measurements can be obtained for setting draft controls and burners and control valves can be aligned into level operating position.

The "Visi-Draft" can be used to level valves even in spaces usually consid-

ered too small to reach. Both direction and amount of leveling necessary can be determined in one check. The level is  $\frac{5}{8}$ " in diameter; it indicates 1° out of level with each 1/10-inch bubble movement.



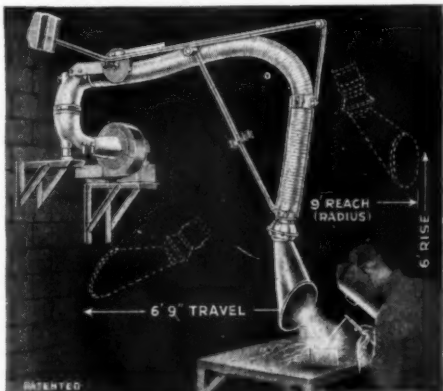
The instrument is made from a solid block of unbreakable plastic. The scale is graduated in .01" divisions and is easily read from above.

**F. W. Dwyer Mfg. Co., Dept. BB**  
**317 S. Western Ave.**  
**Chicago 12, Ill.**

## **RUEMELIN Fume Collector**

**Removes Welding Fumes  
at the Source . . .**

Why continue to let your employees inhale welding fumes? You can solve the problem quickly and efficiently by installing a Ruemelin Fume Collector. It produces a powerful suction that draws out noxious gases, smoke and heat at the source. Guards employee health, resulting in less welder fatigue, therefore, greater plant output. Clears shop air with minimum loss of building heat. Covers maximum welding area vertically, horizontally and by circle swing. Shipped assembled, easy to install, 9 ft. and 15 ft. sizes (radius of swing).



Free engineering service for your fume collector installation. Write for Bulletin 37-C.

## **RUEMELIN MFG. CO.**

**3980 NO. PALMER STREET MILWAUKEE 12, WIS., U.S.A.**  
**MANUFACTURERS AND ENGINEERS—SAND BLAST AND DUST COLLECTING EQUIPMENT**  
**— WELDING FUME COLLECTORS**

#### BURG RELEASING TAP HOLDER

Burg Tool Manufacturing Co. announces the redesigned "Tool-Flex" neoprene mounted releasing Tap Holder, that simplifies tapping on turret



lathes, drill presses, screw machine and engine lathes. Blind hole tapping, or tapping to a definite stop is simplified.

*The very best  
facilities for*

**STAMPINGS**

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**DAYTON ROGERS**  
*Manufacturing Company*

Minneapolis (7), Minn.

since the turret is set to travel to a specified depth, then the holder permits the tap to spin freely with the spindle. When the spindle is reversed, the holder locks the tap and backs it out of the work piece. The end play provided in the holder prevents tearing of threads when backing out.

The neoprene mounting absorbs shock, keeps taps on center, and permits them to follow the original hole, thus preventing tap breakage due to misalignment and shock, and assuring perfect thread from one piece to the next. All moving parts of the holder are made of high grade tool steel, heat-treated and ground to close tolerances. This factor, coupled with the simple construction, assures long life under high speed operation. For additional details, write:

**Burg Tool Mfg. Co., Dept. BB**  
5028 W. Jefferson Blvd.  
Los Angeles 16, Calif.

#### JIG & FIXTURE TYPE RECESSING TOOL

A new recessing tool has been designed for precision recessing where the tool must work through jigs or fixtures. It is being made available in three sizes to machine diameters ranging from  $\frac{1}{2}$ " to 2-3/16". The tools pilot into standard bushings and operate on any manual or automatic feed spindle. The diameter of the recess is governed by the actuating stroke of the tool, which is set by adjustment of the stop collar when used on a manual feed spindle. The distance from the face of the work to the recess is controlled by adjusting the ball-bearing stop bushing.



By releasing the combination positive lock and friction clamp, cutters can be interchanged, giving the tool wide range of application. Various types of cutters can be used, such as radius,



multiple-groove, and numerous others. Tool shanks also are interchangeable. Shanks currently are furnished in Brown & Sharpe, Morse taper, adjustable adapter, quick-change and straight types, or to meet individual specifications.

Parts are hard-chrome plated for smooth action, resistance to wear and renewability. Unusual depth of grooves can be handled easily and rapidly. Additional information will be forwarded upon request to:

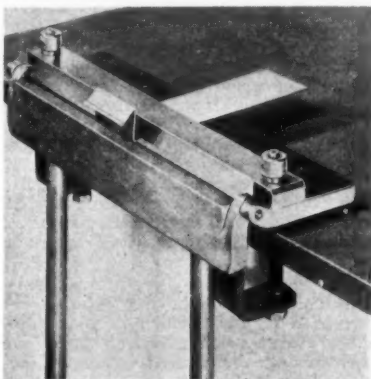
**The Maxwell Co., Dept. BB**  
220 Broadway  
Bedford, Ohio

#### **NEW, PORTABLE METAL BRAKE**

A new line of portable metal brakes is being manufactured by the G & S Machine Shop. These brakes, while strong and designed for heavy duty, are light in weight, and can be quickly and securely mounted on bench or work table by means of screw type clamps.

These brakes bend and form angles, channels, sections in sheet metal, strap iron, aluminum, etc. They are made in three sizes—10" and 18", with a capac-

ity for 18 gauge cold rolled steel and 24", with a capacity for 20 gauge steel. The



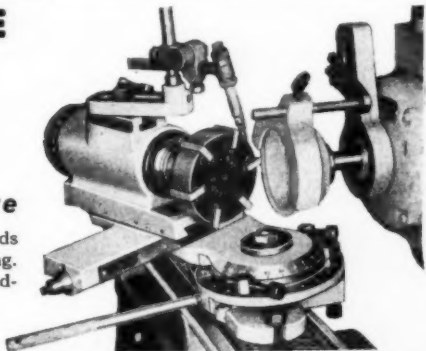
manufacturer will furnish complete details upon request.

**G & S Machine Shop., Dept. BB**  
8700 Grinnell Ave.  
Detroit 13, Mich.

## **For ACCURATE RADIUS GRINDING**

### **Use this "K-O" Fixture**

Handles cutters  $\frac{3}{8}$ " to 10" dia. Grinds convex or concave radius. 180° swing. Adaptable to any tool and cutter grinder. Mail coupon **TODAY** for complete details.



**K.O. LEE  
COMPANY**

**Aberdeen,  
South Dakota**



**K. O. LEE CO., 1113 First Ave. S. E.,  
Aberdeen, South Dakota**  
Please send us your illustrated  
bulletin on the "K-O" Radius  
Grinding Fixture.

Name   
Address   
City  State

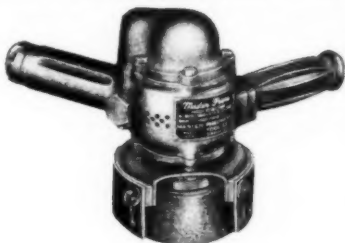
### LIGHT DUTY VERTICAL TYPE GRINDER

A new light weight, vertical type grinder, sander, and wire brushing tool, Model M-401, is now available in free speeds of 6000 and 8000 r.p.m.

Features include an industrial hard chrome finish on important wearing parts. The grinder weighs only seven pounds because of magnesium housings and improved design. A positive governor control assures safety, due to a positive "off and on" throttle control. The unit's small overall dimensions permit working in close corners and limited space. The manufacturers claim that the new grinder uses less air to deliver more power.

The Model M-401 grinder is a flexible tool where light duty metal removal is required, and where the operator must work overhead or in an awkward position. It is designed for such jobs as general grinding of large or small castings requiring the removal of seams, gates, risers, or similar surface obstructions. The tool can also

be used for the sanding of various metal stampings in preparation for a filler coat. Two types are available, with a 5" or 7" sanding pad, either utilizing

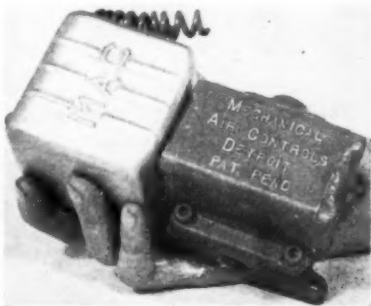


a 4" cup for wire brushing. For complete specification, write:

**Master Pneumatic Tool Co., Inc.**  
Keith Building — Dept. BB  
Cleveland, Ohio

### 4-WAY SOLENOID AIR VALVE ASSURES POSITIVE SEAL

A new 4-way solenoid air valve for the control of double acting cylinders is announced by Mechanical Air Controls, Inc. The design incorporates the ease of operation of the balanced type valve and the "seal with air pressure" feature of the poppet type.



The valve's one moving part consists of two small "O" rings assembled on an alloy piston. The "O" rings give positive seals in conjunction with hard chrome seats which are integral with

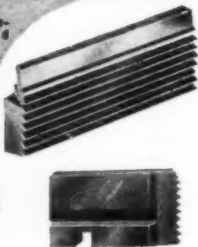
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the bronze body. The need of gland packing is eliminated.

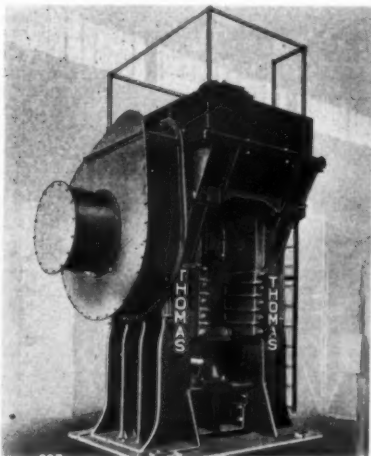
Although compact, a full  $\frac{3}{8}$ " orifice along with straight-through flow minimizes pressure drop through the valve. Restriction of exhaust will not affect valve operation. Direct solenoid control, utilizing only 2.4 amps at 220 volts, assures fast operation for any air application. Available at present in the  $\frac{3}{8}$ " size of any voltage or cycle requirements. For additional information:

**Mechanical Air Controls, Inc.**

3049 E. Grand Blvd., Dept. BB  
Detroit 2, Mich.

#### **BILLET SHEAR STRESSES SPACE ECONOMY**

The Thomas Manufacturing Co., has recently announced a Billet Shear of advanced design. All gears and the motor drive are overhead and all moving parts are enclosed. This design results in considerable floor space economy, greater accessibility and a heightened factor of operator safety.



Construction features include an all cast steel housing; an air operated multiple jaw type clutch; and cast steel herringbone cut gears running in an oil bath.

The 1200 ton machine pictured is

operating in a steel mill where it is used to obtain test pieces from rollings of structural shapes. For complete specifications and performance data, write:

**Thomas Machine Mfg. Co., Dept. BB**  
Butler Road  
Pittsburgh 23, Pa.

#### **NEW PUMP PLIER**

A new pump plier has been added to the line of tools manufactured by the Bonney Forge and Tool Works. It is identified as Model B-34, and is 9" in length. The plier is designed for general use and has a wide range of adjustment permitting high leverage on objects in a wide range of sizes. The jaws are maintained in a relatively parallel position to eliminate slippage and the subsequent rounding of corners. The patented design of this drop forged plier removes the load of strain from the bolt insuring strength and long life.

**Bonney Forge & Tool Works**  
Dept. BB  
Allentown, Pa.

## **LUCIFER**

**ELECTRIC FURNACE  
HOLDS ANY  
TEMPERATURE FROM  
350-2000° F.**

The model D 7052 Lucifer Electric Heat Treating Furnace permits a temperature regulation within 350-2000° F. Any temperature can be maintained as long as desired with this electric input control type. Its usable muffle size is a full 12" x 12" x 12" ample for the average shop. Model D 7052 comes completely equipped. . . there's nothing else to buy. The furnace is easy to operate and will pay for itself in a short time.



**GILBERT S. SIMONSKI**  
403 N. Broad St. Philadelphia 8, Pa.

### ARO BALANCER SUSPENDS PORTABLE TOOLS

A new balancer, Model 7072, for suspending portable tools in shop or production line work, is announced by The Aro Equipment Corp.. The new balancer can be quickly adjusted for correct balance on all types of portable tools weighing up to 10 lbs.

Its use steps up workers' efficiency by keeping working space clear of hose or cords, yet having the tool where the operator needs it for instant use. The unit eliminates needless repair costs, resulting from accidental dropping and mishandling of tools.

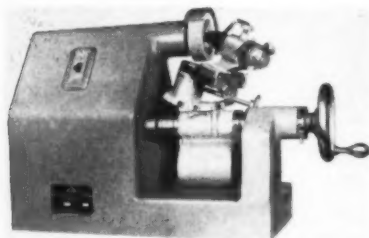
Light weight construction of the unit is achieved with all steel stamped housing and drum. A high-temper spring insures long life and trouble-free service. The balancer can be adjusted by moving the spring trigger, located on the shaft, to lower the tension. To increase the tension, wind shaft clockwise with an open end wrench. For complete details:

**The Aro Equipment Corp. Dept. BB  
Bryan, Ohio.**



### NEW UNIT OFFERS RAPID, ACCURATE GRINDING OF CUTTERS

The new Pierce G-A Grinder with automatic clearance is announced, offering economy in angle, ball, and radius cutters ground from prepared, halved blanks. All varieties may be ground from blanks in as little as 5 minutes, and may be resharpened in as little as



one minute. The resulting single lip cutters demonstrate improved efficiency in diameters to .375". They are free cutting, and will produce a fine finish even at high speeds and feeds. It is no longer necessary for die and mold shops to stock small, special radius and tapered end mills.

The automatic clearance feature is foolproof. The cutting edge with the desired predetermined clearance is ground in one operation. Setup is rapid and only reasonable skill is required. Operators of milling, routing, duplicating and engraving machines can readily grind cutters to their specific needs.

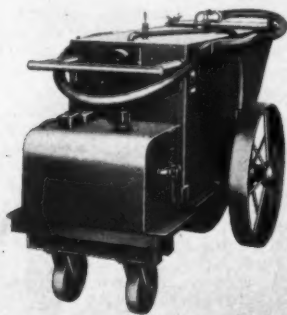
Single lip tools are especially satisfactory in small diameters which permit high speed operation. Modern vertical mills, routers, duplicators, and universal milling heads are now made with precision ball bearing spindles suitable for 5000 r.p.m. or more. Single lip cutters are excellent for use with these machines for such intricate work as deep narrow grooves with desired draft, special radius work, and modeling.

The Pierce G-A Grinder will grind several new cutter shapes, such as flat bottom cutters which produce an almost mirror-like bottom cut, and a bottom radius cutter with large radius for gently curved modeling or form guide work. For further information:

**Pierce Machine Tool Co., Dept. BB  
625 W. Jackson Blvd.  
Chicago 6, Ill.**

### NEW SUMP CLEANER REMOVES CONTAMINATION QUICKLY

A redesigned Sump Cleaner has recently been announced by Honan-Crane



Corp. This unit removes chips, grindings, cutting oil or soluble coolant from machine tool sumps, or scale and other contamination from quench and settling

tanks, with efficiency and maximum time saving. In actual operation the Sump Cleaner will clean up an individual machine in 10 minutes or less, the manufacturers state.

The unit transfers oil or coolant from sump to tank by vacuum, and no contaminated liquids pass through the pump.

A three-way valve can instantly change suction to pressure, permitting the unit to be used for dispensing clean liquids as well as removing dirty liquids. Each unit is equipped with a drain valve for drawing off any liquid with salvage value before dumping.

Two sizes are available, with either 80 or 125 gallons capacity. Standard equipment includes a 1/2 h.p. induction motor with V-belt drive, and starting switch; also a 10-foot extension cord with plug and a 10-foot, 1 1/2" neoprene suction hose with 30" nozzle.

**Honan-Crane Corp., Dept. BB  
911 Sixth St.  
Lebanon, Ind.**

## SAVE MONEY

### USE ENCO TOOLHOLDERS

Write for catalogue  
giving lathe swing and  
tool size used.

Model 4 1/2-S Turret Tool Post Shown above for 14" to 16" lathes

- ★ 12 Position Indexing
- ★ 3 Working Positions for Each Tool
- ★ Hardened Steel Construction
- ★ Accurate Reindexing
- ★ Other Models Available for Lathes 6" to 42" Swing.

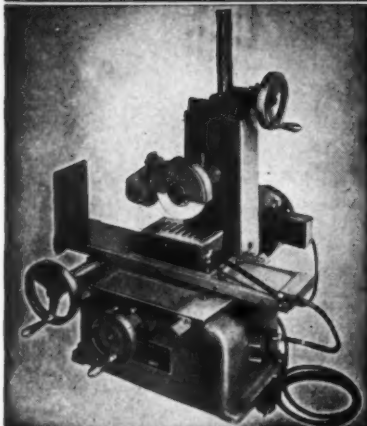
Also Mfrs. of Enco Hex turret Bed Turret for 9" to 16" Lathes.

Model B Tailstock Turret shown above for 12" to 20" lathes.

- ★ Mounts 6 Tools
- ★ Hardened Tapered Indexing Mechanism
- ★ Finger Tip Control
- ★ Turret Lins up Directly with Spindle Center
- ★ Furnished with No. 2, No. 3 and No. 4 MT Arbors.

**ENCO MANUFACTURING COMPANY Dept. 27 4524 Fullerton Ave., Chicago 39, Ill.**

# SANFORD



## High-Speed BENCH SURFACE GRINDER

ACCURATE WITHIN .0001

A sensitive machine built to rigid standards of accuracy and workmanship specially designed "For the job that fits in your palm."

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**SANFORD MFG. CO.**

1020-28 Commerce Ave.

Union, N. J.

## NEW DEVICE DETERMINES ROCKWELL HARDNESS OF METALS

A new Superficial Hardness Tester, for Rockwell testing, is announced by Clark Instrument, Inc. The instrument is designed for testing surfaces that must not be marred, even by the standard Rockwell indentation. Depth of penetration is held to limits of .005" or less.

The new unit is suitable for testing surface hardened steel, exceptionally thin metals, or very small areas. It can also be used for standard Rockwell testing of metals that are of uniform hardness throughout, or wherever a test of surface hardness only is wanted.



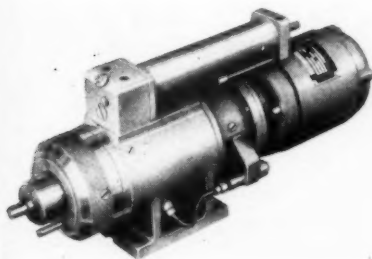
The Clark Superficial Hardness Tester is available in three models, with 8", 12", or 16" vertical capacity. Standard equipment with each tester includes a formed and lapped diamond cone penetrator and a 1/16" steel ball penetrator, as well as a standard 3 1/2" anvil, a checking anvil, a "V" anvil, and a raised "V" anvil. Full details and specifications may be obtained from:

**Clark Instrument, Inc., Dept. BB**  
10200 Ford Road  
Dearborn, Mich.

## PNEUMATIC—HYDRAULIC POWER UNIT

Production drilling can be done in any position, angle or plane by a new air-hydraulically operated power unit developed by Cleveland Republic Tool Corp. The drill unit, made in two models, can be used as a single unit or combined with several for simultaneous operations. One model, the 250, can be used to drill  $\frac{1}{4}$ -inch in steel, while the other, the 500, is suitable for drilling  $\frac{1}{2}$ -inch in steel. The units may be used not only for drilling, but milling, riveting, chamfering, slot sawing and spot facing.

Both models feature a rapid approach and variable feed which allows the tool to come within .001" of the work, at which point the work feed automatically cuts in. Each drill unit also includes a micrometer adjustment and lock screw to control depth of drilling, counter-sinking, and chamfering to tolerances of less than .001".



Motor and operating mechanism are totally enclosed, preventing the entry of dirt, chips or coolant. Ample bearing support to the spindle enables it to hold runouts to .0005". Units can be provided with hand, foot, semi-automatic or fully automatic controls. The power units may be attached to present machines by brackets. For complete performance data, write:

Cleveland Republic Tool Corp.  
Dept. BB, 1265 Union Commerce Bldg.  
Cleveland 14, Ohio.

*Tapered Keyways  
• Keyways in Tapered Holes  
• Multiple Keyways in Same Bore*

with a  
**STANDARD  
GLENNY**  
Adjustable  
Expansion **PUSH BROACH**

Recognized everywhere as the most efficient, safe and economical tool for keyway cutting—the Glenny now reaches out to perform many new, time and money saving operations through four ingenious, inexpensive types of bushings, announced in Bulletin No. 11.

THE GLENNY IS KNOWN FOR OFTEN REDUCING KEYWAYS COSTS AS MUCH AS TEN TIMES. YOUR GLENNY NOW PROVIDES EVEN GREATER SAVINGS.

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835 EAST 140th STREET • CLEVELAND 10, OHIO

**STANDARD  
D-4  
Abrasive  
Band  
Grinder**

Famous  
for  
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 $\frac{1}{4}$ " band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW  
MANUAL ON FINISHING—WRITE TODAY

**WALLS SALES CORP.**  
306 E. 38th St., New York 16, N.Y.



### INDEXING TURNTABLE FOR INDUCTION HEATERS

An Indexing Turntable for induction soldering, brazing or heat treating has been developed by Sherman Industrial



Electronics Co. Work pieces are placed either manually or automatically on

work holders and all operations thereafter are electrically and air controlled. As many as 12 work stations can be provided on the standard turntable top. Holding jigs to fit special work piece shapes are available from the manufacturer or may be added by the user. The metal cabinet is of heavy gauge steel, finished in grey crackle.

Heating time of 1 to 60 seconds is controlled by an adjustable electric timer. Limit switches and electric air valves insure the proper sequence of operation. Air pressure regulator, oiler and filter are part of the standard unit. The operation requires 60 pound air supply and 220 volt, 60 cycle, single phase power.

The photograph shows the unit in use with a 2 KW Induction Heater, Sieco Type SI-2. The Indexing Turntable may also be used directly with Sieco Heaters of 5, 10, and 15 KW output. For details, write:

Sherman Industrial Electronics Co.,  
Dept. BB  
Belleville 9, N. J.



## The Automatic FLEXOPRESS

IT CUTS • IT PUNCHES • IT PERFORATES

The true value of FLEXOPRESS is recognized in all well equipped plants.

- Completely automatic — one operator tends 6 or more presses.
- High speed production—9,000 to 40,000 pieces per hour.
- Cuts light metals and other materials in lengths to 9 inches.
- Low tooling costs.

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A PRODUCT OF

**Ace Tool & Die Works**

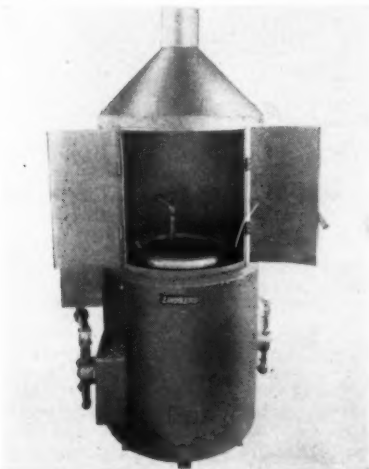
125 E. McMICKEN AVE.  
CINCINNATI 10, OHIO



## GAS-FIRED POT FURNACES HAVE YEAR GUARANTEE

A new type of pot furnace featuring cyanide pots with a one year guarantee has been announced by Lindberg Engineering Co., manufacturers of industrial heat treating and melting furnaces. Known as the Lindberg Hi-Life gas fired pot furnace, this new development has been tested and proven in actual production line operation. Furnaces with from 8000 to 15,000 hours of operations behind them are still using original pots. In addition to extended pot life, the manufacturer claims faster heating and greater efficiency.

The one year guarantee covers all "Hi-Life" pots used with cyanide or lead (neutral salts excluded), under



automatic temperature control. The furnace is available in four standard sizes using pots 24" x 21"; 20" x 21"; 16" x 18" and 12" x 18". Bulletin 22, "Lindberg Hi-Life Gas Fired Pot Furnaces", is available on request to:

**Lindberg Engineering Co., Dept. BB**  
2444 W. Hubbard St.  
Chicago 12, Ill.



PATENT APPLIED FOR

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## E-CON-O-MILL

STANDARD CARBIDE FACE MILL

### CUT DOWN TOOL INVENTORY

All cutter bodies, made 5-inch diameter and over, take the same size blades and locks. Blades have different radial rakes for cutting steel, cast iron, and non-ferrous materials.

### SAVE ON GRINDING COSTS

New blades come finish-ground, individually cartoned, ready to be put to work. They may be re-sharpened one by one on a carbide grinder. E-Con-O-Mill checking gage insures quick and accurate duplication of cutting edges.

### REDUCE DOWN-TIME OF MACHINES

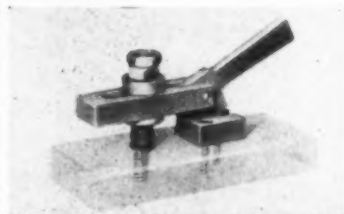
Blades may be removed by hand, without removing cutter body from machine. Locks stay attached to the body. New or re-sharpened blades may be lined up against the cut in the work.

THE GAIRING TOOL COMPANY,  
21228 Hoover Road, Detroit, Mich.



Write for illustrated folder  
which gives complete  
data and prices.



**M-T****FIXTURE CLAMPS  
and COMPONENTS**

There is a M-T Fixture Clamp and Fixture Component to meet your most exacting requirements. Immediate delivery.

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**Morton Machine Works**

2422 Wolcott

Detroit 20, Mich.

## WHEN YOU BREAK A TAP YOU NEED A

### WALTON TAP EXTRACTOR

Prices  
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The fastest, easiest, safest and most economical way to remove a broken tap from the work is with a WALTON EXTRACTOR.

**No Mangled Threads—**

**No Scrapped Work—**

**No Frayed Nerves**

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**THE WALTON COMPANY**  
Hartford 10, Conn.

## SIMPLEX WELDERS' VISE STRESSES STRENGTH AND MOBILITY

A recently developed, useful accessory for tool rooms and welding shops is the Desmond-Simplex Welders' Vise, available in three models, with 5, 6, and 7-inch jaw openings. A double swivel arrangement enables the work to be held in the most advantageous position for fast and accurate welding. The vise can be mounted on the corner of a welding bench to hold work securely in a convenient welding position.



The illustration shows that the welder does not have to bend or crouch, since the work is held so as to assure fast, precise welding. Due to its sturdy construction, the vise can be used for many types of work requiring material to be held at various angles. Simplex vises are constructed with a solid steel slide, adding considerable increased strength.

A catalog containing complete specifications is available upon request to:

**The Desmond-Stephan Mfg. Co.**  
Dept. BB  
Urbana, Ohio

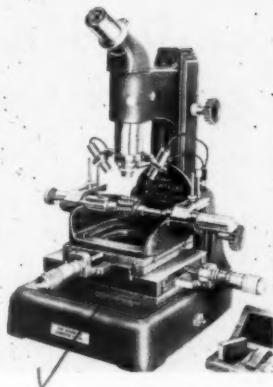
### WILDER TOOLMAKERS' MICROSCOPE

This toolmakers' microscope represents an entirely new design, combining precision and essential features with simplicity. It consists of a Meehanite base and post, on which the Meehanite microscope bracket is vertically adjustable by spiral rack and pinion. An additional vertical adjustment of the microscope tube within the bracket is provided for greater capacity, particularly when handling work between centers.

The microscope tube provides a standard magnification of 30x for the image of the work. The standard reticule in the eyepiece contains a 90° hairline cross and a 60° angle cross for thread measurements. For thread checking, the vertical post may be tilted to the helix angle of thread.

The work is either laid on the compound measuring stage or held in a center cradle that attaches to it. Measurements in 2 directions are by 1" micrometer screws that read directly in .0005". The design of the stage is such, that for the highest accuracy, gage blocks may be used in both directions instead of the micrometer screws. The longitudinal range is 2".

Both understage illumination for shadow images and surfaces illumination for reflected images are provided, so that any part, regardless of shape or nature, can be handled. The image in the eyepiece is produced on a clear



glass reticule, not on frosted glass, which results in a maximum of definition and in the highest degree of measuring certainty.

**George Scherr Co., Inc., Dept. BB**  
200 Lafayette St.  
New York 12, N. Y.

### QUICK-OPENING DEVICE FOR GAS CYLINDERS

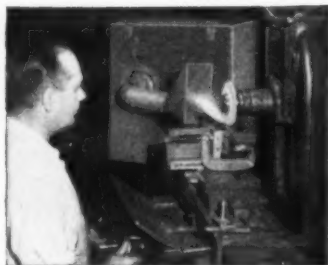
The "E-Z-Opener" is a simple device which facilitates the opening of compressed gas cylinders, permitting a considerable saving of air or gas, since the cylinder valve can be closed tighter when not in use. It is a one-piece casting, readily fitted over the standard cylinder valve handle, and securely tightened in place by a knurled set screw. With this opener in place, the main valve of the tank is easily turned without recourse to a wrench, and it is possible to close the valve much tighter with consequent elimination of gas leakage. The "E-Z-Opener" is manufactured by:

**Nutmeg Industries, Dept. BB**  
45 Deacon St.  
Bridgeport 7, Conn.



## STOP THAT DUST

with **DUSTKOP**



MODEL 420 ILLUSTRATED

■ Keep machines and workers free of costly, abrasive dusts. Stop worker's complaints. The portable, self-contained **DUSTKOP** can be placed beside any machine and relocated later. Can usually be in operation 20 minutes after uncrating. Easily connected with metal hose or pipe. With a cyclone separator and spun glass filter, a direct-driven, self-clearing fan, **DUSTKOP** has the high suction capacity to give you **TOP PERFORMANCE**.

### CHECK THESE ADVANTAGES:

- ☐ **DUCTLESS** installation
- ☐ Operates only when needed
- ☐ Low maintenance
- ☐ Firesafe construction

Write for Catalog A-415 NOW

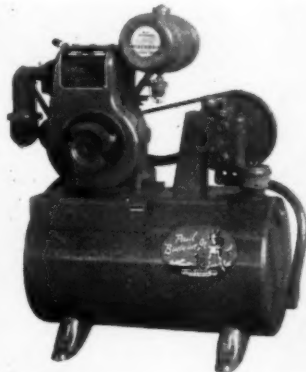
**AGET-DETROIT CO.**

205 Main at Washington  
Ann Arbor, Michigan

### NEW UNIT PROVIDES HYDRAULIC POWER ANYWHERE

In places remote from a source of electric power, the new Paul Bunyan, Jr. Unit, equipped with an air cooled gasoline engine, provides hydraulic power for a wide range of practical uses. The unit puts hydraulic power into the portable class for such uses as leveling bridges, raising and moving buildings, on gasoline operated shovels, heavy jack work, raising and lining railway tracks, wrecking operations, and a great many others.

This gasoline-engine-equipped Power Unit, capable of supplying 3 gallons of oil per minute at 1000 p.s.i., can be taken to the job wherever it is located. Its precision-built gear pump is mounted integrally with the operating valve, which has a ball-handle lever operated at forward, neutral, and reverse positions. Check and relief valves are built in the main valve body. Perman-



ent suction and return lines are installed between the pump and tank. The tank is supplied with an oil level gauge and air filter breather cap. Space occupied by the unit is 16 x 28 x 36 inches. Further information will be sent on request to:

**Hydraulic Press Manufacturing Co.**  
Dept. BB  
Mount Gilead, Ohio

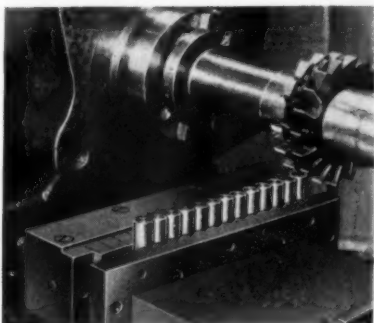
### DERY EQUALIZING GANG VISE

A modern solution to the troublesome problem of holding more than one piece of work at one time has been developed by the Dery Tool & Die Co. The new device is known as the Dery Gang Vise, and is a completely equalizing unit, allowing the machining of from two pieces to the total capacity of the vise, which varies in proportion to its length.

The vise consists of a solid jaw and body which holds a series of equalizing pads or blades. The solid jaw is locked to the body with screws, and the work inserted. The "V" grooves and the pad thus form a three-point chuck for each piece of work. The pads and grooves are the same width as the diameter of the work. Pieces with a diameter variance can be milled simultaneously, since the blades will equalize, allowing each individual piece to be held firmly. The vise leaves no scoring on soft metal pieces.

The nuisance of chips in the blade slots is eliminated by the use of a steel dust cap. Chatter is done away with,

due to the equalizing factor of the vise, and the use of special heads allows as many operations as are practicable.



For complete structural details and further information on the Dery Gang Vise, write:

Dery Tool & Die Co., Dept. BB  
Pine Meadow, Conn.

## SPRING PRESSES

### POWER AND FOOT OPERATED

For riveting, staking, stamping and similar operations on small light parts. Constructed to compensate for variation in thickness of the work and to deliver a **UNIFORM BLOW AT EVERY STROKE.**



M-110 (illustrated) motor driven to eliminate fatigue factor of foot operated press—similar press M-130, equipped to operate by compressed air.

### OTHER T & F MACHINES

Duplex Spline  
Millers — Me-  
dium Duty and  
High Speed  
Sensitive Drill-  
ing Machines.

Send for Bulletin



EST. 1834

**THE TAYLOR & FENN CO.** HARTFORD 1, CONN.

### NEW 4-WAY VALVE FOR HYDRAULIC SYSTEMS

Electrol, Inc., has developed a 4-Way Selector Valve, which offers a simple means of controlling flow to the remote actuating cylinders of hydraulic systems. The valve consists of an aluminum alloy body with four line connections, and includes a group of conventional, spring-loaded, balanced-type poppet valves interconnected by ducts, which direct the fluid to the desired channel. Actuated

by cams, the valves are so arranged that the rotation of the camshaft opens the proper combination of poppets to direct the fluid through the valve to the desired location.

Efficient ducting of the fluid and reduced pressure drop are assured by coaxial assembly and adequate passage size. Further details can be obtained by writing the manufacturer.

**Electrol, Inc., Dept. BB**  
**Kingston, N. Y.**

### G & H Collet type INDEXING FIXTURE

Faster finishing of multi-machined precision parts.

G & H fixtures speed machining of pieces requiring similar operations on one machine. Precise production on straddle, plain milling, slotting, drilling, tapping. Index plates interchangeable. Many other features.

**G & H MFG. CO.**  
327 Elm Street  
Fitchburg, Mass.



### SOMETHING NEW IN A LOW PRICED ROTARY LAYOUT TABLE



Accurately calibrated throughout the 360° of rotation.

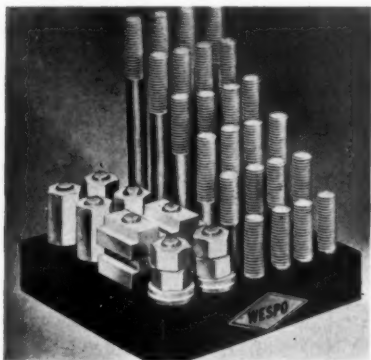
Indispensable for tool rooms and model shops. Six-inch diameter table—thimble calibrated in minutes. Knurled lock screw does not disturb setting. Eccentric adjustment compensates for wear.

Write for free literature today.

**THE ERWOOD COMPANY**  
214 WOODSTOCK STREET  
CRYSTAL LAKE, ILLINOIS

### IMPROVED STUD AND NUT SET

A conveniently arranged stud and nut set is being introduced by West Point Manufacturing Co. Sets are available in  $\frac{3}{4}$ ",  $\frac{5}{8}$ ", and  $\frac{1}{2}$ " standard thread sizes—class 3 fit. Each set includes four each of 3", 4", 5", 6", 7", and 8" studs, and four each of the nuts, washers, T-slot nuts and coupling nuts.

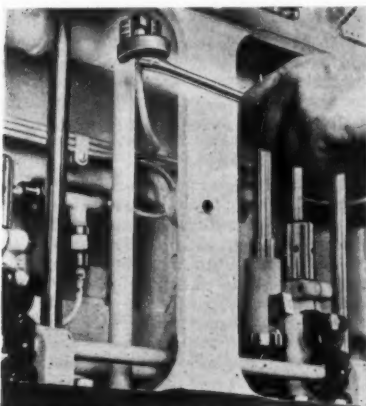


The coupling nuts enable the operator to obtain stud lengths from 3" to 16". The specially designed and machined T-slot nuts permit the use of studs to the full capacity of the T-slot. Studs are made of heat-treated alloy steel with threads cut after heat treatment to prevent distortion. All parts are cadmium plated. For further details, write:

**West Point Mfg. Co., Dept. BB**  
19629 Merriman Court  
Farmington, Mich.

### NEW OPEN-END WRENCH HAS MULTIPLE USES

A useful and versatile tool is the new T.A.C. open-end ratchet wrench, recently announced by C. J. Hendry Co., large San Francisco ship chandlery and



mill supply house. It is designed for use on pipe, tube, conduit, cable, and rod fittings where an ordinary ratchet cannot be used. The ratchet heads operate in a  $7\frac{1}{2}^\circ$  arc or less, making it ideal for work in restricted areas.

The T.A.C. tool was originally designed for shipboard use, and is standard equipment on all U.S. Naval vessels, but its time-saving qualities are making it useful in the aircraft, automotive, electrical, and other industries.

T.A.C. ratchet heads, sockets, and accessories may be bought separately or in sets in practically all sizes. An adaptor makes it possible to use standard sockets with the T.A.C. ratchet head. Descriptive literature and information on distributorships is available from:

**C. J. Hendry Co., Dept. BB**  
27 Main St.  
San Francisco, Calif.

Greater rigidity with less weight is claimed for hand trucks made of magnesium. Magline, Inc., Pinconning, Mich., is manufacturing this in four

models, one with a ladder-type rack which facilitates its use on trucks. The crossbars on another model curve slightly so that bags, barrels, and the like are more easily carried. The nose is formed in a single piece and cut outs are tapered to reduce the weight while maintaining strength.

### NEW VISE USES AIR PRESSURE AS CLAMPING FORCE

The Bellows Co., announces the development of the Model DVH-150 Air-Hydraulic Vise. This new unit employs flexible, controlled air pressure as a clamping force. It develops a clamping pressure of 150 times the operating air line pressure from any air line up to a maximum pressure of 125 lbs.

The opening of the jaws is adjustable to a maximum of 5" in increments of thirty-seconds of an inch, through a positive locking adjusting nut on the hydraulic ram. The vise operates through the full range of the jaw opening with a jaw power movement of only .2", ample for clamping most rough castings, and providing important safety protection. In addition to the 6" wide hardened steel jaws, the vise is equipped with soft steel false jaws. Power is obtained from a Model BM-10

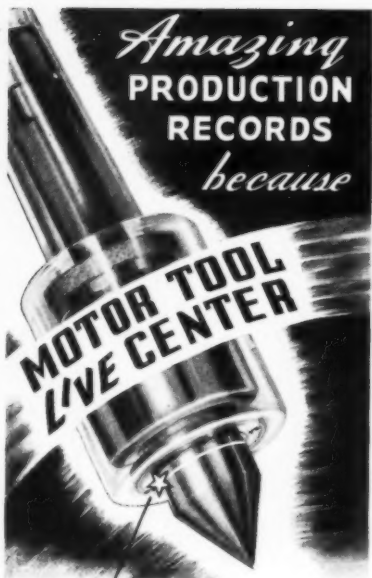


Bellows Air Motor in combination with a built-in hydraulic intensifier unit.

The new Model DVH-150 is available with either mechanically-operated valve for hand operation or for mechanical synchronization to machine movement; or with a low voltage solenoid valve for electrical operation. Overall length is 30-3/16", width 9", height 6 1/8". For complete specifications:

**The Bellows Co., Dept. BB**  
Akron, Ohio





is the **ONLY** Center  
with the  
**OVERLOAD  
INDICATOR**

Look for the **RED BAND**

You no longer have to guess whether you are overloading your live center thrust bearings if you use **MOTOR TOOL LIVE CENTERS**. When the load is too great the **RED BAND** around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the **RED BAND** is visible you are running **COOL** and **SAFE**.

Send for

NEW descriptive folder . . . and verified case histories of how **MOTOR TOOL LIVE CENTERS** have out-performed and outlasted ALL other centers on exceedingly tough, continuous-run jobs.

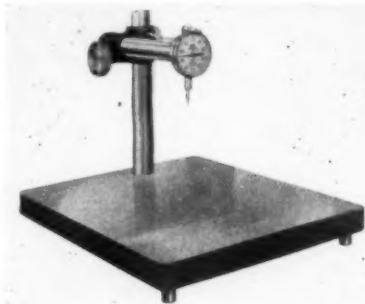
**MOTOR TOOL MFG.CO.**  
8663 DAYTON ST. DETROIT 10, MICH. PHONE OR (313)

Make it a Rule  
to Call Motor Tool

#### AMES COMPARATOR FOR CHECKING HEAVY WORK

A new, heavy-duty type of Dial Comparator, the No. 130, is announced by the B. C. Ames Co. Designed to provide a larger-size, precision Comparator of greater range and utility, the No. 130 is especially useful for applications requiring the checking of comparatively heavy parts, such as large-diameter shafts, solid blocks having large cross-sections, etc. The rigid construction also makes it extremely accurate for general dimension checking on light-weight parts.

The base is solid 1"-thick steel, with the top ground to a close-tolerance flatness. Three-button support of the base eliminates rocking. The solid steel 1 1/4"-diameter upright post is permanently fixed to the base. The 1"-diameter steel indicator bar has its own clamp, allowing indicator reach and adjustment to be made without changing the post clamp's vertical position. For close setting of the indicator pointer on the dial, there is available a special vertical adjustment which attaches to the back of the indicator.



The base is available in any size, such as 10 x 10", 10 x 14", 16 x 16", etc., and the size selected determines the weight of the Comparator. The upright post can be furnished in any desired height. For complete details, write:

**B. C. Ames Co., Dept. BB**  
Waltham 54, Mass.



## ELECTRIC DRILL KITS FOR LIGHT-DUTY INDUSTRIAL USE

Two new electric drill kits of precision engineering and manufacture, for the home craftsman and light-duty industrial use, are being offered by Century Drill & Tool Works. The kits are encased in strong utility boxes, each containing a portable Fairchild a.c.-d.c. drill, and sets of twist drills of high grade tool steel; one kit contains 14 drills, the other, 20.

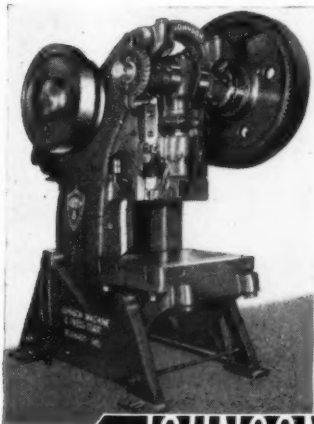
Technical research developed a dependable and portable unit in the Fairchild drill; market research has shown that the public wanted a full set of high grade, hardened drills racked in a detachable stand for bench use. The Eagle Kits combine drills in sizes from 1/16" to 1/4" and a portable drill with improved keyless three-jaw chuck and other modern features.

The 110/220 volt motor, in a two-piece cast aluminum alloy housing, with automatic lubrication, has armature and field coils wound with long-life Formex wire; the chuck speed is guar-



anteed at over 1100 r.p.m. The armature shafts turn on bronze Oilite bearings. Century Drill & Tool Works, Dept. BB  
96 Lafayette St.  
New York 13, N. Y.

NOT TOO BIG FOR SMALL RUNS — NOT TOO SMALL FOR BIG RUNS



# 90 TONS

and MORE DIE SPACE!

# Johnson

## No. 8

### INCLINABLE POWER PRESS

Extra thick bolster plate interchangeable with thin steel bolster . . . massive semi-steel cast frame . . . extra long gibs . . . friction type brake . . . patented tripping device.

# JOHNSON

MACHINE AND PRESS CORP.  
620 W. INDIANA AVE., ELKHART, IND.

WANT LONGER TOOL LIFE  
... LESS DOWN TIME?

IT'S BEING DONE

WITH **LUSOL**

**THE TOOL SAVING FLUID**

SUCCESSOR TO  
ORDINARY CUTTING OIL  
AND  
SOLUBLES



**THE NEW DAY  
COOLANT THAT  
SPEAKS FOR ITSELF**

The word is spreading . .  
a trial will convince you

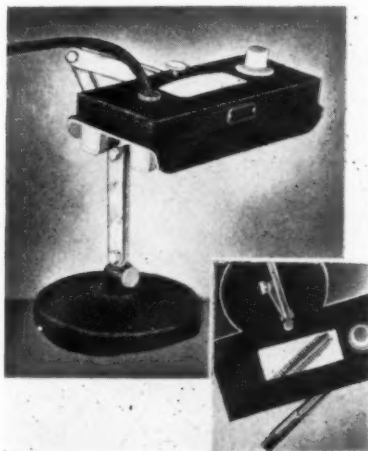
*write - wire - phone*

**F. E. ANDERSON  
OIL COMPANY**

712 BROWNSTONE AVE.  
PORTLAND, CONNECTICUT

#### **MINIATURE DUAL-VISION FLUORESCENT MAGNIFIER**

Precision inspection, assembly, and machining operations can be accomplished with greater ease and accuracy with this new compact combination of glare-free light and optically correct magnification. The intense illumination of 350 foot-candles floodlights the object from widely divergent angles, revealing all surfaces. Both eyes observe the object in detail through the 2-power lens mounted in the reflector between twin 5-inch fluorescent lamps. Since the point of observation is directly behind the light source, internal surfaces of holes and cavities can be seen with ease. A lamp surface temperature of only 115° F. allows close work in complete comfort.



The standard fixture is finished with black wrinkle exterior and a baked white enamel reflector. The fixture measures 6¼" long, and weighs 10 oz. It is available with easy-adjust chrome supporting bracket for machine and bench installations. Four-watt lamps of standard manufacture are required. For complete details on the "Lite-Mite" unit, write for illustrated bulletin to:

**Stocker & Yale, Dept. BB  
Marblehead, Mass.**

# Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding ... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA  
50,000 R. P. M.

**\$42<sup>00</sup>**

IN U. S. A.

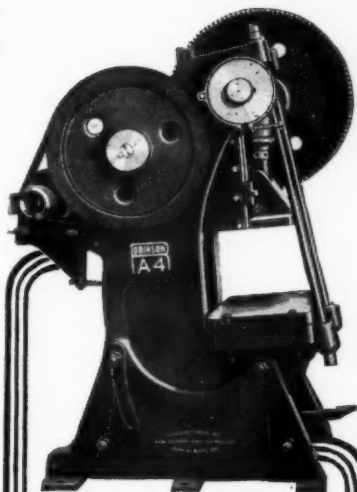


Weight 12 ounces;  
length 6¾ inches;  
chuck size ⅜ inch.  
Wheel guard re-  
moved for better  
illustration.

**MADISON-KIPP CORP.**

207 Waubesa St., Madison, Wis., U.S. A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS



## The ROBINSON Inclinable PUNCH PRESS

The new and improved Series A Robinson Punch Press is noted for safe, dependable operation. Sturdily built and employing finest construction features, a Robinson Series A offers years of trouble-free operation at minimum maintenance cost. Five sizes now available for immediate delivery.

**New Albany Machine Mfg. Co.**

NEW ALBANY, IND.

**ROBINSON**

Inclinable  
PUNCH PRESSES

### NEW COOK CARBIDE-TIPPED TOOL

The R. F. Cook Manufacturing Company has announced the extension of their standard line of circular carbide-tipped cutting tools to include a new shape capable of performing turning and single chamfering operations.

The new tool incorporates four individual cutting edges, and each tool can be used through all four cutting positions before the machine must be stopped for tool resharping.

The tool can be used on any type of automatic and is held in a similar manner to high speed steel tools of the same type. The carbide-tipped tool can be used for high-speed long production jobs or for limited-piece operations. Carbide cemented carbide tips provide maximum tool life without breakage and facilitate desired part finish and maximum pieces per tool grind. Descriptive Bulletin A-8 will be furnished upon request.



**R. F. Cook Mfg. Co., Dept. BB**  
2732 Second St.  
Cuyahoga Falls 9, Ohio.

### NICKEL AND CHROME-PLATED SHEET ALUMINUM

The reappearance of nickel and chrome plated aluminum sheet in its line of pre-finished metals, is announced by American Nickeloid Co.

Nickel or chrome plated aluminum is offered in sheets only in sizes up to 36" x 96", in a wide range of tempers and gauges. Due to the lightness of the metal and the greater square footage

per pound nickel and chrome plated aluminum are lower in cost than many metals. The manufacturer offers a folder available upon request, describing nickel and chrome plated aluminum and some of their successful applications.

**The American Nickeloid Co., Dept. BB**  
Peru, Ind.

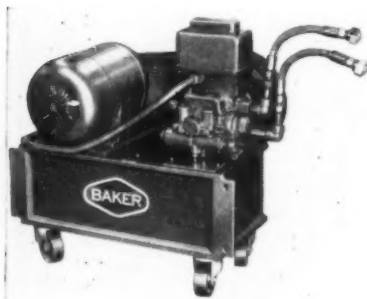
### HYDRAULIC POWER UNIT REDUCES DOWNTIME

A separate mobile hydraulic pump and tank unit is introduced by Baker Brothers, Inc., for use with hydraulic feed way type units. The new power

unit, mounted on casters, provides ready exchangeability of units when desirable, together with smoother machine operation through efficient cooling of the hydraulic fluid.

The unit is attached to the operating cylinder of machines by high pressure hose lines joined with self-sealing couplings that permit breaking the line without influx of air into the hydraulic system. The Baker hydraulic pump unit uses a new Oilgear variable delivery feed pump of the positive displacement, variable delivery, radial piston type. For more information write:

**Baker Bros., Inc., Dept. BB**  
1000 Post St.  
Toledo, Ohio.



### GRANT SPINNERS WITH AUTOMATIC TRIP MECHANISM

The Grant Manufacturing and Machine Co. has developed an automatic trip mechanism for use on three of its noiseless rivet spinning machines as shown in the accompanying illustration of the Type No. 120A. The Automatic Trip is a time- and labor-saving device enabling the operator to form heads on rivet shanks in from one to two seconds, depending on the rivet diameter, and requiring only a minimum of pressure on the treadle.

The trip mechanism is powered by a  $\frac{3}{4}$ -h.p. motor, and the spindle motion for proper riveting performance is automatically achieved by means of a cam. Depressing the foot treadle actuates the trip for one cycle, or the heading of one rivet. The operator may remain seated while running the machine. Maximum capacity of these machines is  $\frac{7}{16}$ " diameter. For additional data, write:



Grant Mfg. & Machine Co., Dept. BB  
CE Station  
Bridgeport 5, Conn.

### HOW TO GRIND CARBIDE CUTTING TOOL BITS ECONOMICALLY



#### *Here's tool grinding at its best!*

Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

**LeMaire Tool & Mfg. Co.**

2637 S. Telegraph Road  
Dearborn, Michigan

*Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-it Gear Chucks.*

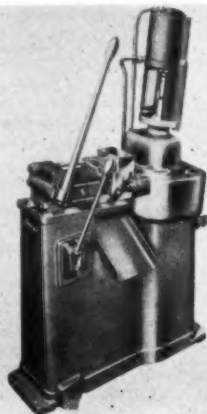
## DCMT ANNOUNCES NEW DIE CASTING MACHINE

A new, small-type die casting machine is announced by the DCMT Sales Corp. The new model M55A/HF is an air-operated die casting machine, designed for quick, economical casting of small parts in zinc alloy, utilizing single-cavity dies operating at high speed. It can maintain a production rate of 20,-000 shots per week, yet is simple and light.

New features include optional hand and foot controls and an air system with pilot and ram valves integral. Toggle links are forged clevis hardened steel. The machine carriage is undercut for downpulls and ejecting large castings. The base plate is adjustable to allow the use of die blocks of any required thickness.

The pot is a new type, using hydraulic suction to fill the cylinder. There is a porthole at the base of the pot which allows all the metal in it to be used before refilling becomes necessary. Ejector boxes are of a new, quick release type. For complete operational data on this die-casting machine, write:

DCMT Sales Corp., Dept. BB  
315 Broadway  
New York 7, N. Y.



## WHITNEY-JENSEN PRODUCTS 30 YEARS EXPERIENCE

### No. 5 Jr. PUNCH

Capacity  
1/4" hole thru 16 ga.  
weight — 2 3/4 lbs.



Write for Catalog 16-48

WHITNEY METAL TOOL COMPANY  
115 FORBES ST.      ROCKFORD, ILL.

## HIGH SPEED

### Automatic

### STAKING MACHINE

Here's a machine that will produce in excess of 1000 pieces per hour. Whether it's staking, riveting, eyeletting, burring, etc. this high speed staking machine will deliver the production. Hammer blow is adjustable . . . impossible to trip hammer with finger in die. . . operator's hands are free for work . . . work is held by pressure pad while being struck by hammer. Write for full particulars.

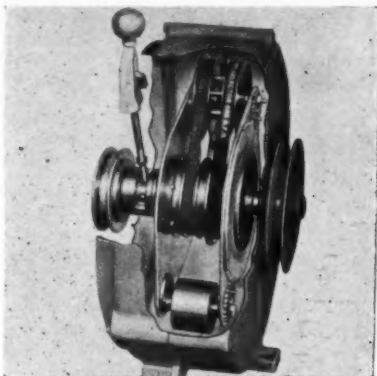


HIGH SPEED HAMMER CO.  
311 Norton St., Rochester 5, N. Y.

## SPLIT SECOND VARIABLE SPEEDS FROM 0 TO 800 R.P.M.

A new 5 h.p. model of a revolutionary speed control having unlimited ratios is announced by Speed Selector Inc. This variable speed drive utilizes a new principle of planetary motion applied to speed changers in combination with standard V-belts and variable pitch sheaves, making possible infinite ratio, split-second control of speeds from 0 to 800 r.p.m., and into reverse where needed.

The wide range of speeds provided by Speed Selector increases machine versatility and efficiency. Its design eliminates the need for gear shifts, clutches, multi-speed motors and step pulleys. Speed Selectors have cast iron sheaves on hardened and ground shafts, and guide pins with sealed prelubricated ball bearings, mounted in strong, light cast aluminum housings. Optional V-belt or flexible coupling input and output make the Speed Selector adaptable for mounting in any position on new



or existing equipment. For details, write for Bulletin SS-12, to:

**Speed Selector Inc., Dept. BB**  
118 Noble Court  
Cleveland 13, Ohio

## BUFFALO PNEUMATIC CHIP GUN

**A NEW METHOD OF REMOVING  
CHIPS FROM BLIND DRILLED AND  
TAPPED HOLES.**

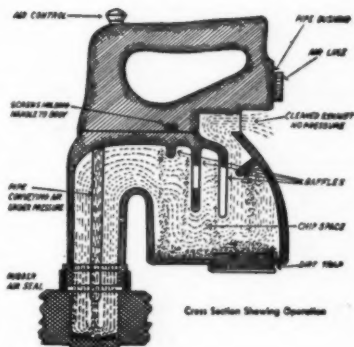
**SAFE! CLEAN!  
EFFICIENT!**

Eliminate the danger to your workmen from flying chips by removing your cuttings with the BUFFALO PNEUMATIC CHIP GUN. Simply place the nozzle over the hole, release the air by thumb pressure and the cuttings are deposited in the body of the gun.

**Available in two sizes:**

**Model A—For  $\frac{1}{8}$ " to  $\frac{5}{8}$ " dia. holes**

**Model B—For  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " dia. holes**



**Write for Bulletin No. 1011 today**

**BUFFALO MACHINERY CO., INC.**  
835 Grant Street  
Buffalo 13, New York

## SEVERANCE CARBIDE MICRO CENTER REAMERS



A new Carbide Tool has been developed for the finishing of centers after heat-treatment. The burnished-like finish produced when hardened materials are turned or milled with carbide tools is well known to the users of carbide tools. This finish is now obtainable in the centers of parts having hardness up to 63-C Rockwell with Severance Micro Center Reamers. These Carbide Reamers have their cutting teeth developed to avoid any possibility of chatter and to correct any existing irregularities. They are also useful for shifting centers to correct any misalignment.

Micro-Center Reamers replace abrasive center polishing and center lapping and may be used in standard center lapping machines, or drill presses,

the manufacturers state. They have the standard 60° included angle and are available in  $\frac{3}{8}$ " and  $\frac{1}{2}$ " diameter and may be reground many times.

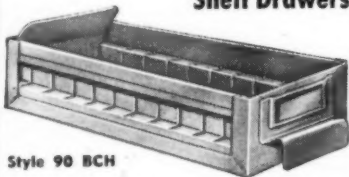
For detailed information, address requests to:

**Severance Tool Industries Inc.,**  
Dept. BB, 722 Iowa St.  
Saginaw, Mich.

## FRACTIONAL H.P. FAN MOTOR

The new Type C permanent split capacitor type fan motor incorporates several features designed to give quiet performance and long life. Manufactured by Electro Machines, Inc., for use on direct connected fans and blowers, the motor has no centrifugal switch. The unit is totally enclosed in a steel housing and is equipped with lifetime lubricated ball bearings. Optional features include built-in 2-speed pull chain switch and short cord for plug-in connection brought out of frame. The motor is available in ratings from 1/20 to  $\frac{3}{4}$  h.p. It can be furnished with extended through bolts, standard welded

## Steel Adjustable Compartment Shelf Drawers



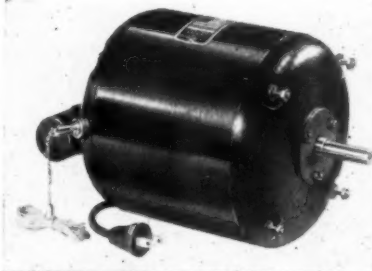
Style 90 BCH

Ideal for handling and storing small quantities of small parts. Slotted on 1" centers to accommodate dividers. Label holder on front. Pull handle on front only. Finished in baked green. Dividers furnished at slight extra cost.

- |  |                         |
|--|-------------------------|
| 91 BCH $5\frac{1}{2} \times 11\frac{1}{2} \times 2\frac{1}{2}$ | Green Finish—92c ea.    |
| 92 BCH $5\frac{1}{2} \times 17\frac{1}{2} \times 2\frac{1}{2}$ | Green Finish—\$1.06 ea. |
| 93 BCH $8\frac{1}{2} \times 11\frac{1}{2} \times 2\frac{1}{2}$ | Green Finish—99c ea.    |
| 94 BCH $8\frac{1}{2} \times 17\frac{1}{2} \times 2\frac{1}{2}$ | Green Finish—\$1.18 ea. |
- All Prices F.O.B. Philadelphia Plant

Phone — Wire — Write

**BAY INC.** 3003 No. 16th St.  
Philadelphia 32, Pa.  
Telephone BALdwin 9-1805



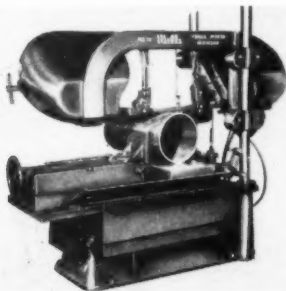
foot construction, removable bolted-on base, or with frame drilled to meet special mounting requirements. For additional information, write:

**Electro Machines, Inc., Dept. BB**  
Cedarburg, Wis.



## METAL SAW EQUIPPED WITH WET CUTTING SYSTEM

The new No. 12 heavy duty metal cutting band saw, with automatic cutting cycle and electrically controlled



blade pressure, recently announced by the Wells Manufacturing Corp., is now available with a self-contained wet cutting system.

The system, which is installed as an integral part of the saw, includes a chip pan, fluid tank, centrifugal type pump-motor unit, splash guards and protective screens. The chip pan is mounted firmly between bed and base. All working parts are accessible and a convenient valve permits adjustment of flow. The working capacity of the system is three gallons of fluid.

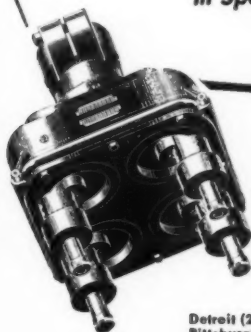
Experience in the use of a similar system in conjunction with the smaller Wells No. 8 saw has proven that the system permits safe use of higher f.p.m. cutting speeds and increases blade efficiency. Further information may be obtained from the manufacturer.

**Wells Mfg. Co., Dept. BB**  
**Three Rivers, Mich.**

An easily maneuvered can fork constructed of extruded magnesium tubing is being manufactured by Magline, Inc., Pinconning, Mich. The model resembles a rake with 16 widely-spaced prongs, and its light weight facilitates handling of several cans at a time.

In Specifying Drillheads . . .

CONSIDER THE  $\left\{ \frac{P}{C}{D} \right\}^*$  FACTORS



When you install a Thriftmaster Multiple Spindle Drillhead in your production line, you have positive assurance that:

\*It is a **PRECISION** tool which, while adjustable, locks in a rigidly fixed spindle location for accurate production.

\*The high overload rating of Thriftmaster, guarantees many thousands of hours at full **CAPACITY** of the tool in steel.

\*Rugged construction, plus full ball bearing mounting, will provide extreme **DURABILITY** and dependable service.

**\*PRECISION • CAPACITY • DURABILITY**

For complete information, write to: Engineering Department, Thriftmaster Products Corp., 1048 N. Plum St., Lancaster, Pa.

Detroit (21) E. B. Parish Company  
Pittsburgh (3) Voss Machinery Co.  
Chicago (7) Gatz-Arnold Company  
Cleveland (12) T. J. Fraser Tool Supply Co.

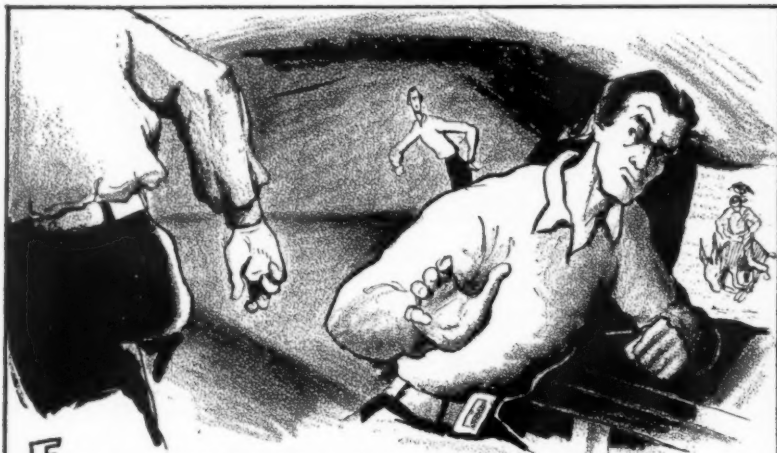
Boston (16) A. R. Shevlin Company  
Philadelphia (40) Wright & Gade Tool Co.  
Indianapolis, R. L. Guimont Co.

# THRIFTMASTER

## Multiple Spindle Drillheads

FIXED AND ADJUSTABLE CENTERS

# Mechanics Through the Ages



**E**NGLISH MECHANICS OF THE 1700'S AND LATER SHOWED THEIR DISAPPROVAL OF A NEW SHOP WORKMAN WHO FAILED TO COME UP TO SHOP STANDARDS BY REFUSING TO SPEAK TO HIM AND BY PLACING NEAR HIS BENCH A PICTURE OF A MAN SEATED ON A BUCKING DONKEY!

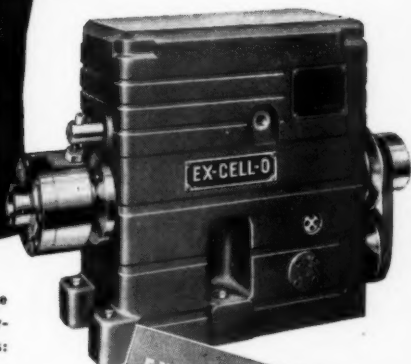


**T**HE SOLDIERS OF ANCIENT ROME WORE CHAIN MAIL WHOSE LINKS DID NOT INTERLACE BUT WERE WELDED TOGETHER AT THE EDGE.



**AS LATE** AS THE MID 1800'S, A PRIMITIVE ASIATIC TRIBE FROM THE CARPATHIAN MOUNTAINS MADE AND EXHIBITED IN VIENNA BEAUTIFUL WOOD GLASSES, BOTTLES AND VASES WHICH THEY TURNED ON CRUDE RECIPROCATING LATHES, CENTERED ON TREES, AND WORKED BY CORDS, FASTENED TO SAPLINGS!

# Design for ECONOMICAL PRODUCTION



FOR THE machine you build, or the machine we build for you, the use of Ex-Cell-O Hydraulic Power Units provides these features:

- They are compact, for inexpensive machine design.
- They have automatic cycles, for automatic production machines.
- They have infinite feeds, for proper cutting.
- They have ample power, for multiple-spindle operation.
- They have variable stroke, for greater flexibility.
- They are self-lubricated, for economy in maintenance.

Illustrated here is Style 20, the smallest Ex-Cell-O unit, suitable for the high spindle speeds required for operating small diameter tools efficiently, and built to stand up under continuous, fast operating cycles. The automatic cycle includes rapid approach, infinitely variable dial adjustable feed rate (a second feed is available as extra equipment), rapid return and stop. The unit is arranged for electric start and emergency return control.

48—38



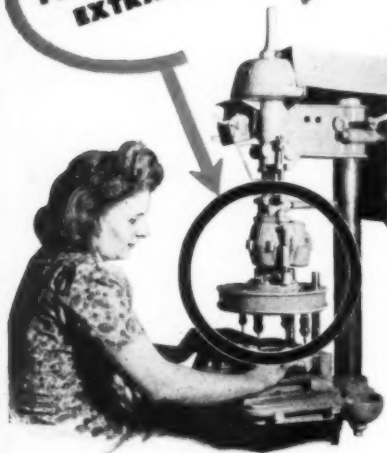
## EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN



Send for Catalog 45361. It shows how Ex-Cell-O Hydraulic Power Units can be profitably applied to many production problems.

**INCREASE HOLE  
PRODUCTION WITHOUT  
EXTRA MACHINES**



With Ettco-Emrick Multiple Spindle Heads mounted on your drill presses you get any required small parts drilling or tapping production at lowest tool and labor costs. Ettco Multiple Heads take up no additional floor space, yet — as many satisfied users have found — they make possible increases in output amounting to 100% or more. This is because they provide both the METHOD and the EQUIPMENT for drilling or tapping the maximum number of holes at every stroke of the press.

**WRITE FOR BULLETIN NO. 31**

It completely describes the Ettco-Emrick Multiple Head System and gives examples of the various methods used. Write for a copy today.



**ETTCO TOOL CO.**

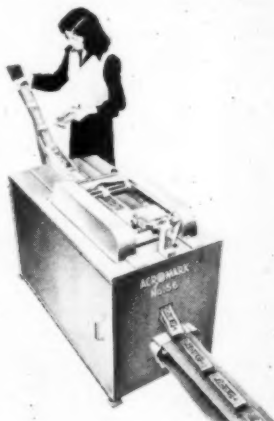
**596 Johnson Ave., Brooklyn 6, N. Y.**

Boston, Massachusetts • Portland, Connecticut  
Detroit, Michigan • Chicago, Illinois

**MACHINE APPLIES ENAMEL TO RAISED  
LETTERING**

Signs, end-plates, name plates and other sheet or cast metal or molded plastic products can be automatically enameled on the raised faces of letters, numbers or designs with the new Acromark No. 56 Machine.

The unit is completely enclosed in a sheet metal cabinet, 24" x 36" x 60" except for the enamel applying rolls which are fully guarded and move backward and forward in a horizontal plane in the top part of the machine. A revolving ink platen, a disc revolving beneath an enamel fountain transfers the enamel to the rolls that in turn pass over the parts to be enameled as they pass along a conveyor, moving horizontally through the enameling position, which then drops the parts down a chute where the regular plant conveyor carries the enameled parts away for drying.



The parts shown in the illustration are embossed aluminum of size 8" long x 3" wide with a 1½" flange on each end. Speed of enameling these parts is 2000 per hour. This machine is motor driven and has push button control.

For further information and details:

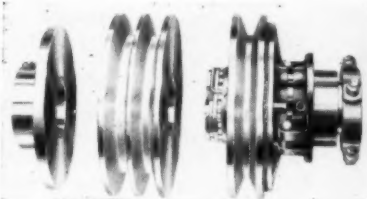
**The Acromark Co., Dept. BB**  
15 Morrell St.  
Elizabeth 4, N. J.

### NEW CLUTCH WITH INTEGRAL V-BELT PULLEY

Quicker release, reduced wear on V-belts, smoother starting, and easier take-up for wear are claimed for a new self-contained V-belt clutch pulley with the pulley an integral part of the clutch assembly, recently announced by The Edgemont Machine Co.

The clutch permits new applications in small portable conveyors and special machinery using V-belt or chain drive. It is furnished in ratings of  $\frac{1}{4}$  and  $\frac{1}{2}$  h.p., at 100 r.p.m., and in shaft sizes from  $\frac{3}{4}$ " to  $1\frac{1}{4}$ "; it is available with V-belt pulleys with one "B" groove of  $3\frac{1}{2}$ ",  $4\frac{1}{4}$ ", and 5" pitch diameter, or with two "B" grooves of  $4\frac{1}{4}$ " or 5" pitch diameter. Special V-belt pulleys, or adaptors for mounting sprockets or gears, are available.

To engage the clutch, a steel cam moves two levers which initiate a friction plate axially against the liner, engaging the pulley, which is restrained from axial movement by an adjusting collar. A snap ring on the adjusting



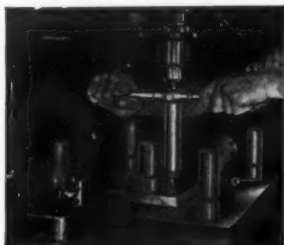
collar engages with notches on the rim of a steel washer keyed to the clutch body, hence take-up for wear is accomplished by positive adjustment. For complete operational data on this unit, write:

**The Edgemont Machine Co., Dept. BB**  
2132 Home Ave.  
Dayton 1, Ohio

## LASSY UNIVERSAL TAP & GUIDE FIXTURE



Guide in use threading



Guide in use tapping

**\$49<sup>75</sup>**

Complete with 12 adapters  
No. 5 thru  $\frac{5}{8}$ "  
(taps not furnished)

Capacity No. 5  
thru 1"  
Pipe taps to  $\frac{3}{8}$ "  
Dies to 1" O. D.

This new, handy versatile tool is ideal for all hand tapping and threading. On the lathe tapping and threading can be done under power. Large work is tapped right on the drill press without juggling it around. Attaches to wall or bench.  $12\frac{3}{4}$ "x $6\frac{1}{2}$ "x17"; wt. 32 lbs.

Send for free circular:  
"Short Cuts to Tapping and Threading"  
From your mill supply house or

**LASSY TOOL COMPANY** 108 Bohemia Street, Plainville, Conn.

Also makers of Bench and Floor Tapping Machines.

### SPRING AIR PRESS REDUCES OPERATOR FATIGUE

A new Spring Air Press, designated as Model RR-5, has recently been developed by Winter Products, Inc. This Air Press is designed to cover the entire range of foot or kick press operations. Equipped with a two-handed safety release, the press lessens the hazard of lost fingers or crushed hands. Its basic improvements permit not only a reduction in plant accidents, but tend to increase production, due to the quick set-up and ease of operation. These features enable the operator to put in a full day of production without fatigue.

The standard spring is rated at 200 lbs. per inch of compression. The maximum blow obtainable is approximately 6400 lbs. through a working distance of  $1/16"$ , at the bottom of the stroke. For a working distance of  $1/32"$ , the maximum force is 12,800 lbs; for a working distance of  $1/8"$ , the force amounts to 3200 lbs.

A useful feature is an adjustable hold-down finger which descends before the

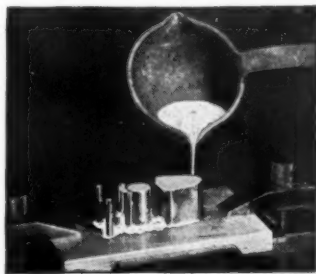


ram is actuated, holding the work in place on the fixture, or squeezing parts to be riveted by the ram blow.

---

## CUT DIE MAKING COST WITH CERROMATRIX

Leading American and European manufacturers use the fast accurate Cerromatrix Method of locating punches in relation to dies, without machining non-working surfaces to close dimensions. Dies and punches permanently secured for long runs.



*Clip this ad to your letterhead to receive  
36 page Cerromatrix Manual.*

**Cerro de Pasco Copper Corp.**  
**Dept. No. 7, 40 Wall St., New York 5, N. Y.**

---

The RR-5 press is 34" high; the table measures 5" x 10"; the base is 10" x 12". The machine has a throat depth of 4", with an adjustable throat height of from 2½" to 8". The press will attain a maximum of 85 strokes per minute, with an air pressure requirement of from 40 to 110 lbs. For complete details and specifications, write:

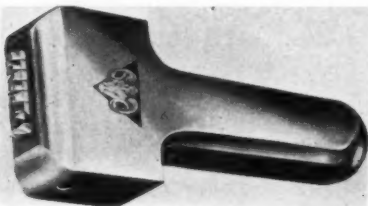
**Winter Products, Inc., Dept. BB**  
189 State St.  
Bridgeport 3, Conn.

#### STEEL STAMP HOLDER FOR MARKING PARTS

Production of a handy steel stamp holder is announced by the Acme Marking Equipment Co. This device can be used for marking parts where it is undesirable to stock a quantity of different stamps, and where information to be stamped must be altered from time to time, such as in short production runs and model changes.

The unit as pictured is designed for hand use, but is also available with press shank for machine operation. The type inserts are easily inserted and removed by simply loosening and tightening a set screw.

The stamp comes in a complete kit with choice of figures only, letters only, or a combination of figures and letters. The holder is available in a complete



range of sizes with slot lengths of 1", 1¼", 1½", or 2", and with type sizes from 1/16" to ¾" high.

Full information may be obtained from the:

**Acme Marking Equipment Co.,**  
Dept. BB, 8030 Lyndon Ave.  
Detroit 21, Mich.

## Little Fiver

### HYDRO-PRESS

**\$84.00**

FIVE TONS of smooth power is at your service with this compact and versatile tool.

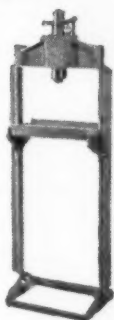
The perfect press for garage, electric motor shop, refrigerator repair and machine shop.

Will operate lying horizontal.

Ram has removable anvil and retracts itself when released.

Stroke 2½"

Weight 100 lbs.

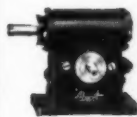


**ARTHUR J. HURT & CO.**

360 SOUTH NAVAJO STREET  
DENVER 9, COLORADO

## Symbol of Speed Reducer Quality

*Abart*  
**SPEED REDUCERS**



Spur, worm, and combinations.

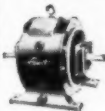
Compact. Dust-proof. Oil-tight.

Maximum power efficiency. Positive alignment.

Meet every installation condition.

Over 75 types and sizes.

Send for complete catalog

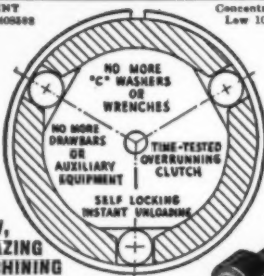


**ABART GEAR & MACHINE CO.**  
4832 W. 16th St., Chicago 50, Ill.



PATENT  
No. 2408888

Concentricity in  
Low 10,000ths



# **NEW, AMAZING MACHINING TECHNIQUE**

**YOUNG PRECISION EXPANDING  
MANDRELS FOR PRODUCTION  
OR INSPECTION**



Curtiss-Wright Corporation ranks our product with their best tools. Cleveland Graphite Bronze Company, leading bearing manufacturer, states new high accuracy reached, plus substantial production boosts.

ROUGHLY SKETCH DESIRED MANDREL INTO YOUR  
PART PRINT AND FORWARD FOR QUOTE.

**YOUNG ARBOR CO. • PH. YE-9784**  
3257 Bradford Rd., Cleveland Hts. 18, Ohio



# **Universal Stock Reel**

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
  2. Reel is adjustable to suit height of Press.
  3. Reel can be inclined to any position.
- Stock Reel with plain bearing \$55.00  
Stock Reel with roller bearing \$65.00

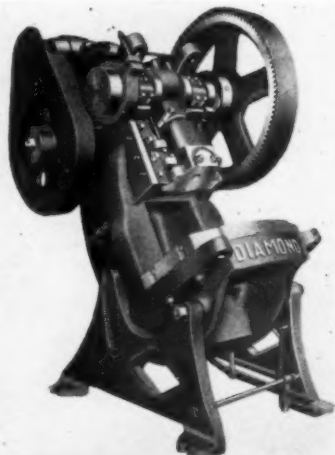
Manufactured By

**John Humm Safety Equipment Co.**  
253 SHEFFIELD AVE., BROOKLYN 7, N. Y.

## **BACK-GEARED DIAMOND PUNCH PRESS**

Diamond Machine Tool Co. announces a new model punch press, again of 56-ton capacity, but possessing back gearing, providing a slower stroke with heavy punching tonnage. The new press is designed to strain gauge analysis, which equalizes stresses more uniformly throughout the frame. The frame is cradle mounted and may be inclined up to 35°. The ratchet feed arrangement operates on thrust ball bearings by means of a square threaded screw. Inclining or raising the frame is performed from either front or rear by one man, requiring only 8 minutes' operation.

The new non-repeat trip mechanism is simple both in design and operation yet is positive in action, according to the manufacturers. Engagement of the



flywheel occurs in any one of three positions during a single revolution, making action almost instantaneous. A nickel-molybdenum steel clutch dog is fully supported within the thick crankshaft collar. Its extra length, together with its large cross section area eliminate clutch fatigue failures resulting from heavy shear and shock loads. The unit has a shut die height of 16";



## NEW AXIAL FACE MILL *by Willey's*



The longer runs between grinds . . . the increased production rate . . . the economy of the long life of the solid carbide blade . . . the familiar simplicity of the high speed technique in the grinding of the blades . . . are all embodied in THE WILLEY AXIAL Face Mill . . . the face mill designed for cast iron milling.

Write for Bulletin FM-90

### WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

a standard stroke of 3"; the maximum stroke to order is 8"; the bed area measures 21" x 30". The press attains 50 strokes per minute. For complete details, write:

**Diamond Machine Tool Co., Dept. BB**  
E. Olympic Blvd.  
Los Angeles 23, Calif.

#### TRIPLE PURPOSE ELECTRIC TOOL

The latest addition to the line of "Metalmaster" portable electric tools manufactured by The Bradford Machine Tool Co., is known as the "Triple Tool"—a combined sander, polisher and drill. Its design permits removing the backing pad for sanding or polishing and substituting a 7B Jacobs chuck for drilling operations. Thus the "Triple Tool" can be used for light or intermittent sanding, polishing, or drilling wood, metal and plastics. Drill capacity is  $\frac{1}{4}$ " in steel,  $\frac{1}{2}$ " in hardwood. Sanding discs and wool polishing bonnet are each 5" in diameter.

Net weight of the tool is six pounds, and it is especially adapted to close quarters work. The motor is a 115 volt a.c.-d.c. type, which drives the disc at



2300 r.p.m., free speed, and at 1400 r.p.m. under normal load. A cast aluminum housing encloses the entire unit.

**The Bradford Machine Tool Co.**  
Dept. BB, 657 Evans St.  
Cincinnati 4, Ohio

# AMAZING

# NEW

# ROTARY ELECTRIC IMPACT TOOL



NUT  
RUNNING



MASONRY  
DRILLING



SCREW  
DRIVING

## DON'T TRUST YOUR IMAGINATION

Imagine doing the toughest job with an electric tool without receiving any kick or twist—imagine the motor continuing to run without burning out when the spindle is stalled completely—imagine cutting nut running time 90%—imagine one tool doing all the operations listed below.

Don't trust your imagination—see it and try it yourself. This all-purpose Ingersoll-Rand Rotary IMPACT TOOL amazes everyone. It won't take any imagination either to realize what a time-saving, labor-aiding tool this is.

Call your nearest Distributor or Jobber, now. Ask for a demonstration of this remarkable tool.

### AMAZING all-purpose ELECTRIC TOOL will

- Drill up to  $\frac{1}{4}$ "
- Run up to  $\frac{1}{8}$ "
- Tap up to  $\frac{1}{8}$ "
- Run Nuts up to  $\frac{3}{8}$ "
- Drive Screws up to  $\frac{3}{8}$ "
- Hole Saw up to  $\frac{1}{2}$ "
- Bore Wood up to  $\frac{3}{8}$ "
- Drive Studs up to  $\frac{3}{8}$ "
- Drill Masonry up to  $\frac{3}{8}$ "
- Extract Broken Studs up to  $\frac{3}{8}$ "
- Wire Brush up to  $\frac{3}{8}$ " dia. shanks.

(Uses Standard Attachments)  
(110 V or 220 V Models available)

## Ingersoll-Rand

285-18

11 Broadway, New York 4, N.Y.



TAPPING



REAMING

### PROPER DESIGN STRESSES STRONG POINTS OF CEMENTED CARBIDES

Proper tool design can do much to overcome weak qualities of cemented carbide and emphasize the strong points so that excessive breakage of cemented carbide tips may be avoided.

From the standpoint of design, the most important good quality of cemented carbide is its high compressive strength, which varies from 500,000 to 800,000 pounds per square inch. The fact that this is the highest compressive strength of any material known should be taken

advantage of by keeping the tip in compression as much as possible while the carbide tool is at work.

Two disadvantages of cemented carbide, the designer must remember, are a limited ability to bend without breaking and low tensile and shear strength.

Elasticity depends somewhat on the amount of cobalt binder used in the carbide tip. The strong, but softer cemented carbide contains a comparatively high percentage of cobalt binder, while the weaker, but harder cemented carbide contains a comparatively low percentage of cobalt binder. The carbide that contains the high percentage of binder will bend more than the carbide that contains the low percentage before breaking. That is one reason why grades containing the high percentage of binder are known as tough grades, since they will resist shocks and bending stresses

to a greater degree before breaking, than the harder, weaker grades.

Low tensile or shear strength necessitates support by a strong material, so that the forces applied against the cemented carbide will be absorbed by the supporting material as much as possible. For this reason, cemented carbide must be generally used as a tip, brazed to a strong shank. A solid  $\frac{1}{4}$ " square bit of cemented carbide would not be of much use because of its low shear strength. Regardless of price, cemented carbide tips, brazed to shanks, are necessary to overcome poor shear strength.

## LUMA Soldering-Tool



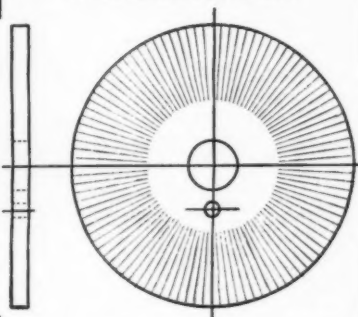
### RESISTANCE TYPE

A proven tool for all soldering jobs large or small. Heats instantly—low maintenance. Safe to operate. Write for details.

**LUMA ELECTRIC EQUIPMENT CO.**  
P. O. Box 132-H TOLEDO 1, OHIO

## CAM BLANKS

FOR  
**BROWN & SHARPE AUTOMATIC  
SCREW MACHINE**  
OF CARBURIZING QUALITY



**AMERICAN TOOL WORKS INC.**  
HARTFORD CONN.

## YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

| Vise No. | Width of Jaw, inches | Opens, inches | Weight, Pounds |
|----------|----------------------|---------------|----------------|
| 1D       | 3 1/2                | 3 1/4         | 12 1/2         |
| 2D       | 5                    | 5 1/2         | 23             |

Do you need a vise of ANY type?

*Write today for bulletins on  
the extensive Yost line*

**YOST MFG. COMPANY**  
1335 5G. MAIN ST.  
MEADVILLE, PENNSYLVANIA

## NIELSEN Heavy Duty *Live Centers*

*Write for  
catalog on  
live centers*

Adapted  
for heavy  
duty work.  
Precision type  
ball and roller  
bearings assure  
maximum capac-  
ity for high speed  
production and long  
service.

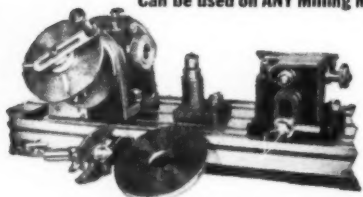


**NIELSEN, INC.** LAWTON, MICH.

# CUT MILLING COSTS *with* KEMPSMITH STANDARD ATTACHMENTS

## *Universal* DIVIDING HEAD

Can be used on ANY Milling Machine



A Kemp Smith Universal Dividing Head is a precision tool, designed and built to retain accuracy. Combines simplicity and convenience with rigidity and accuracy. High number indexing attachment, spiral cutting mechanism and chuck with adapter also available. Ask for Bulletin No. 119.

Kemp Smith Standard Attachments broaden the scope of your milling machine . . . lower capital investment . . . save in set-up time.

**KEMPSMITH MACHINE CO.**

1827 SOUTH 71st STREET  
MILWAUKEE 14, WIS., U. S. A.



**KEMPSMITH  
ARBORS**

in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

# KEMPSMITH

**Precision Built Milling Machines Since 1888**

### TESTS ENABLE SCRAP IDENTIFICATION

A plan for quick identification of scrap involves three tests: magnet tests, spark tests and chemical spot tests. A small permanent hand magnet is the best and simplest method for determining whether material is ferromagnetic. This serves best as preliminary identification.

The spark test is applicable to metals which oxidize rapidly when heated in air to a high-enough temperature. Characteristic sparks are emitted by iron and nickel base compositions and certain al-

loying agents in steels. The success of this method depends upon duplication of conditions each time a test is made or upon a reliable set of checking standards—same lighting and pressure, examination against a dark background, etc. A high-speed power grinder, with the sparks flying off horizontally, is the best for a spark test. The metal part should be held stationary and touched with a portable grinder wheel at a speed of approximately 8,000 feet per minute.

Spot tests are based on the reaction of elements with various reagents and may be simple or elaborate. Methods of testing include tests made from filter paper by an electrographic method or on spot plates. Through a prescribed process the filter paper becomes impregnated with dissolved matter from the unknown metal and is treated to bring out those color reactions which are desired.

The size of the filter paper need not be large—one-half to one inch square is sufficient.

The drop test is more common and is accomplished by dropping acid or alkali on the surface of the metal. Thereafter, the tests may be made on the metal surface itself, on reagent-impregnated filter paper to which the solution drop has been transferred, or on a spot plate. Best results are obtained by using small quantities of reagents and in this connection capillary tubes are ideal for transferring.

All the tests must be strictly controlled.

**OUR  
EFFICIENT  
TOOL DESIGNING**

*means  
better production  
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

**COLUMBUS DIE TOOL  
and Machine Co.**

930 CLEVELAND AVE., COLUMBUS 1 OHIO



**with MAJESTIC DRILL SHARPENER**

Now you can always have perfectly sharpened fast-cutting drills that really take the proper bite and cut smoothly without chatter. Simply turn the Automatic Dial Control, and Majestic Drill Sharpener is set to grind both cutting edges and both angles exactly alike. Take any size drill from 5/32" to 1", straight or No. 2 taper shank. Fits any grinder. Adjustable to grind drills for cutting hard or soft materials. The Majestic Drill Sharpener is a real production tool that assures longer drill life, speeds up the work and quickly saves its cost in factories, garages and repair shops. Price \$10.95 F.O.B. Factory, ask your supply house, or order direct. Many thousands in use. Circular on request.

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**MAJESTIC DRILL SHARPENER CO.**

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FROM STOCK**

**GREAVES-SILENT BAKELITE GEARS**



No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads... their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time... Money... Labor!

We also make silent gears of rawhide and Fabrolite.

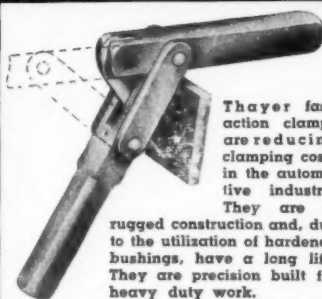
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WITH THAYER CLAMPS**



Thayer fast-action clamps are reducing clamping costs in the automotive industry.

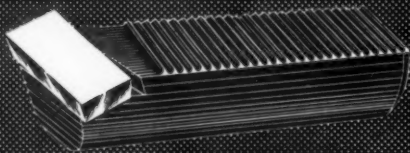
They are of rugged construction and, due to the utilization of hardened bushings, have a long life. They are precision built for heavy duty work.

Full size template sheets sent on request.

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307 Bird Avenue Jackson, Michigan

# ANNOUNCING



## NEW No. 50-18 BLADES

### The "New Look" for Type "A" Lovejoy Mills

Here is a new T.C.T. negative rake blade that will make your oldest Lovejoy milling cutter housings as modern as tomorrow. Yes, it has the same shank size as every Type "A" blade ever made—whether T.C.T., cast alloy or H.S.S. The tip is set so that it really shears steel and cast iron and tosses the chips out. It requires less horsepower than most common blades—it produces cuts with fine finish.

**Compare These Results**—A recent test with NEW #50-18 blades in a 20-year old Lovejoy Type "A" housing gave the following results—**MATERIAL:** 3140—**OPERATION:** face 2" wide x 12" long—**SPEED:** 365 R.P.M. (490 S.F.P.M.)—**FEED:** 60" per minute—**CHIP LOAD:** .014"—**DEPTH:** 1/4"—**FINISH:** good. After 5 1/2 hours cutting time the blades did not require sharpening.

*Lovejoy has blade and cutter styles for all types of milling. For full details write for Catalog No. 28.*

## Lovejoy

TOOL COMPANY INC.  
Springfield, Vermont

### SCRAP SALVAGE IN A METAL WORKING SHOP

Proper storage of scrap represents an important problem for a great many metal working shops. The largest volume of their process metal scrap is represented by metal turnings and borings, consisting of carbon steel, alloy steel, brass, aluminum, magnesium and cast iron.

Wherever waste material is produced, there should be storage facilities nearby, so that collection will involve only a minimum of handling. The ideal space

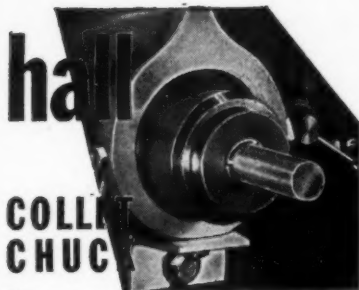
for storage is that near a railroad siding or roadway so that material can be readily shipped out of the plant. Also the various alloys should be separated as this will keep handling time and costs down. In this connection, scrap should be processed before storing, since it is usually bulky and clumsy to handle. The value of the scrap is increased by processing and available space which is at a premium is used to the best advantage. Easier handling, more efficient storage and reduced space requirements result.

Large quantities of scrap should be shipped to the consumer in carload lots whether sold through a dealer or direct. The local waste-material dealer should be given the handling of small quantities of scrap.

An important point to remember is that the steel maker or foundryman, who is the ultimate consumer of scrap, requires a

material furnished in sizes lending itself to ease of handling at his plant, so that he does not have to spend too much time in feeding it into his furnaces.

Materials with a high density, in convenient-to-handle shapes and properly identified, will command more money than those improperly identified and of a low density. Scrap in small pieces will burn more rapidly during melting than heavy scrap. This might mean a high percentage of loss as well as lost time for the melter who has to charge his furnace with low density material.



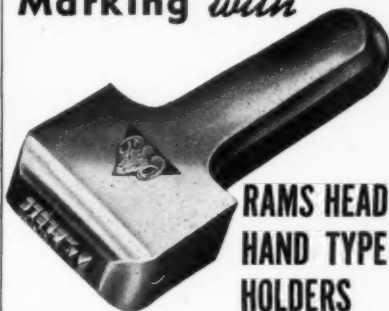
## hall COLLET CHUCK

**SPEED UP** production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295;  
1-inch capacity, \$95

Round, square or hex collets, plain-serrated  
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## Speed Your Metal Marking with



## RAMS HEAD HAND TYPE HOLDERS

Rams Head Hand Type Holders, used with interchangeable type inserts, are designed for production metal marking where the information to be marked varies from time to time. Highly useful for marking names, numbers, dates, etc. Several characters can be used at one time, with uniform spacing and excellent alignment. Type inserts are held firmly in place, yet are easily removable for replacement. Holders for use with press equipment, marking machines, and lathes are also available. Acme Catalog GC-1247 gives full details. Write for your free copy today. **ACME MARKING EQUIPMENT CO.**, 8836 Lyndon Avenue, Detroit 21, Michigan.

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*Check* YOUR CARBIDE  
TOOL ANGLES  
with

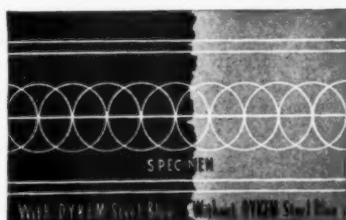


**OPTI-CHECK**

- Magnifies Tool
- Magnifies Reading
- No Fussy Juggling
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- Makes Duplication of Sharpening Angles Easy.
- Checks Drills, Cutters, etc.

*Write to*

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Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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*New SOLID  
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Carbide  
Tools  
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MICHIGAN*

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Lapping hardened plug-gage centers in standard center-lapping machine.

Users of Raymac's new solid carbide center-lap acclaim it as a time and money saver, a tool that —ELIMINATES costly dressing, DUPLICATES center angles as many as 40,000 times before re-conditioning. Used in standard machines at normal speeds.

ORDER YOUR CENTER-LAPS TODAY! Standard sizes from stock:  $\frac{1}{2} \times 1\frac{1}{2}$ " to  $1\frac{1}{2} \times 2\frac{1}{2}$ "—60° included angle, or any degree angle to order.

Also midget and standard solid carbide grinding wheels, reamers, drills and burrs.

**For greatly increased production and economy of operation, order tools with the "Label of Excellence."**

**RAYMAC MFG. COMPANY**

*Incorporated*

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must keep abreast of labor legislation."

As his second point, Col. Steinkraus urged that local businessmen take an active part in community affairs. "It is not enough to pay good wages," he said. "The industrial leader has a responsibility to make his community better with respect to health, schools, and as a good place for workers to make a home."

"Thirdly, tool and die managers must also take a more active part in national affairs," Col. Steinkraus said. "Regardless of which party is in power, the minorities will work day and night to extend government control of business." The local businessman should actively participate in national affairs committees of his local chamber of commerce, and he should write "considered, friendly letters" to Congressmen on important questions. He cited that Congressman Mundt, of the Un-American Activities Committee had stated that he received "100 letters from pressure groups against his committee's program for every one letter from a patriotic citizen."

It is up to small businessmen to stop the growth of bureaucracy, Col. Steinkraus continued. "By expenditures and subsidies, the Federal Government does 30% of the country's total business now."

"If America ever slips from its high industrial position, it will be because the tool and die industry will have slipped in its training of skilled men."

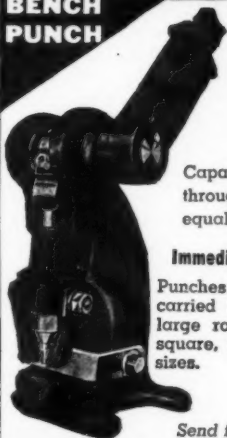
### TOOL AND DIE MAKERS URGED TO TAKE PART IN NAT'L AFFAIRS

A 3-point program for tool and die makers to follow was outlined by Col. Herman Steinkraus recently before 345 executives of contract tool and die shops. The occasion was the Fourth Annual New England Conference of the National Tool and Die Manufacturers Association, held at the Taft Hotel in New Haven, Conn.

"Tool and die shop managers must keep abreast of the labor union movement," he gave as his first point, "even though their own plants are not unionized. They



## FRONT LEVER BENCH PUNCH



**STURDY  
•  
DURABLE  
•  
HANDY**

Capacity:  $\frac{1}{8}$ " hole  
through  $\frac{1}{4}$ " steel or  
equal.

**Immediate shipment.**

Punches and dies are  
carried in stock in a  
large range of round,  
square, flat, and oval  
sizes.

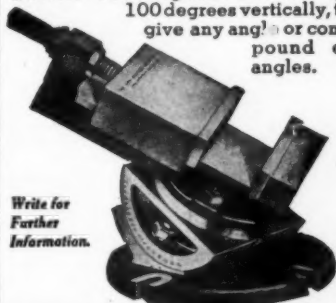
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**THE ORIGINAL**

Swivels 360 degrees horizontally,  
100 degrees vertically, to  
give any angle or com-  
pound of  
angles.



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Further  
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NEW BRITAIN, CONN., U. S. A.

*Interchangeable  
Type and holders  
for every  
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anteed to outper-  
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ter. Write  
for free cat-  
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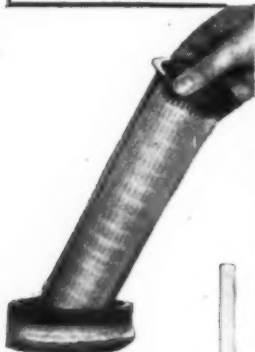
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PROBLEMS**

**MARVEL TOOL & MACHINE CO.**

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# "CATERPILLAR" strains fuel with H&K PERFORATED METALS



"Caterpillar" Photo  
Courtesy Caterpillar  
Tractor Co., Peoria, Ill.

Caterpillar Tractor Co. successfully employs H & K Perforated Metals in the design of its famous line of "Caterpillar" Diesel Tractors. This particular application is a fuel strainer—another actual product example of how "H & K Perforated" serves Industry.

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Protect your machinery the safe way with H & K "Make Your Own" Safety Guards . . . strong, safe, inexpensive. Ask about them!



The  
**Harrington & King**  
PERFORATING Co.

5635 Fillmore St., Chicago 44, Ill. • 114 Liberty St., New York 6, N. Y.

## STEEL DEFENDS ITSELF ON CAPACITY QUESTION

According to U. S. Steel Corp. Subsidiaries, 208 South LaSalle St., Chicago 90, Dr. R. E. Zimmerman, vice president of research and technology of the United States Steel Corporation of Delaware, declared that the industry has expended vast amounts in the last eight years to enlarge and improve its facilities. His statement was made in an address before the New Haven chapter, American Society for Metals, at the Hotel Taft.

Dr. Zimmerman said the industry had

decided on a sound and orderly course of expansion so as to maintain steel prices at the lowest possible level, as at present. He continued: "Steel production last year presented an increase of 60 percent over 1939, a thought-arresting comparison.

"By Jan. 1, 1948, the total ingot capacity of the industry slightly exceeded 94,200,000 tons, and with the completion of plans now in progress, an additional million tons should be added in each of the years 1948 and 1949. That means a rated steel-making capacity of more than ninety-six million tons early in 1950.

"The financial side of the picture is interesting. It is a well-known fact that construction costs have been mounting rapidly in recent years. To provide balanced new capacity in a fully integrated steel plant now requires the expenditure of approximately three hundred dollars per

yearly ton of salable product. What happens under such conditions?

"Either the addition of very high-cost facilities must be kept within reasonable economic proportions, or higher prices must be secured for the products made and sold. Higher prices, in our present economic situation, do not constitute a preferred or desirable method of procedure if they can be avoided.

"Even in the case of steel, which by comparison with other commodities is surprisingly low in price, attempts are being made to recede from the levels attained during the past year."

## CENTER DRILL HOLDER



Rigid and accurate. Holds combination center drill and countersink in tail-stock or headstock spindle of lathe. Made of steel. Shank precision ground.

**SOUTH BEND LATHE WORKS**  
428A East Madison Street  
South Bend 22, Indiana

| Taper Shank | Drill Dia. | Price  |
|-------------|------------|--------|
| No. 2 M T   | 13/64"     | \$2.50 |
| 2           | 3/16       | 2.50   |
| 3           | 7/16       | 2.50   |
| 3           | 13/64      | 3.25   |
| 3           | 3/10       | 3.25   |
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*See your dealer - or wait direct postpaid.*

**SOUTH BEND**

## Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S.—Inexpensive—last for years.

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**NIELSEN TOOL & DIE COMPANY**  
1962 W. Eleven Mile Road,  
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## 60 YEARS' Manufacturing

Multiple Spindle Drilling and Tapping Machines — Automatic Drilling and Tapping Units — Multiple Spindle Attachable Drill Heads — Hot and Cold Swaging Machines — Hammering Machines — Tools, Jigs & Fixtures Contract Work — Special Machinery.

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*New* **NESTING TYPE  
TOTE PANS**

20" Long x 12" Wide x 6 1/4" Deep  
16 Ga., drag holes,  
handles both ends.

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### VARIABLE SPEED TRANSMISSION

For "A" section V-belts—3.3—1 speed range—perfect belt alignment in all positions. Priced so low that no shop or machine need go without infinite speed selection. **\$16.50**  
*See your dealer or write*  
(3 Types—8 sizes to choose from)

**Standard Transmission Equipment Co.**  
78 W. Union Street Pasadena 1, Calif.

## PYRO THE SIMPLIFIED OPTICAL PYROMETER



Unique construction enables operators to rapidly determine temperature even on minute spots, fast moving objects or the smallest streams; no correction charts, no accessories, no upkeep.

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And Punching - Notching Equip.  
Engineering Service

**THE CINCINNATI SHAPER CO.**  
GARRARD STREET CINCINNATI 25, O.

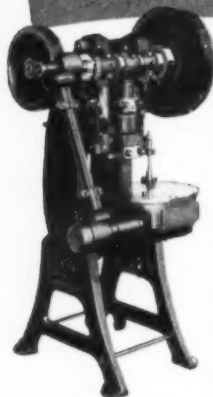
## High Speed Cutting Tools

- Special high speed circular, dovetail, flat form and special tool bits.
- Design and manufacture of small machines, jigs, gages and experimental parts.
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DELIVERY AS REQUIRED  
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## THESE *dial feed* PRESSES



Available in 8 sizes—  
Capacity 6 to 80 tons

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Federal Dial Feeds are known for fast, safe, smooth operation—capable of producing scores of items which formerly required special machinery of limited utility. High speed, greater accuracy, reduced maintenance can save up to 75% in production costs depending on type of work. Built to withstand hardest usage, Federal Dial Feeds may be the answer to your production problem. Write today for catalog on complete line.

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FEDERAL



PRESSES

### VOORHEES DECLARES AMERICA LAND OF UNCOMMON MAN

By Norton Company

America is the land of the Uncommon Man, Enders M. Voorhees, chairman of the finance committee of United States Steel Corp., 208 S. La Salle St., Chicago 90, declared in a commencement day address at the New York City Trade School.

To keep America of and for Uncommon Men requires that the Uncommon Men within it appreciate the fundamentals that underlie our country because it is to them that others turn for guidance in attitudes and decisions which can have

far-reaching effects on our country, he said.

"The Uncommon Man is one possessed of special aptitudes and talents which in America he is allowed and encouraged to develop," Mr. Voorhees said. "You who graduate today thereby prove yourselves to be men of that sort. You have perfected yourselves for service and performance in specialized occupations."

"This is all to the good because it is part of the glorious story of America—of the majestic rise in its productivity—a rise which lifted living scales more than they had advanced throughout all history prior to the advent of the American Republic—. Such achievement comes partly from the fact that no American is born into rigid class restriction or predetermined servitude."

"America is the land of and for Uncommon Men not only because it affords free choice and opportunity

for people to become expert in their chosen occupations, but also because it has mechanisms and incentives for providing the tools of production that the skilled must operate if their skill is to have full fruition in abundant production."

"Markets, when free of monopoly and political dictation, are the most democratic thing in America. The individual's right to appeal through them to the combined judgment of all his neighbors is a most significant bulwark of economic justice and individual independence."



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### **Immediate Delivery!**

Standard Size Dowel Pins from  $\frac{1}{8}$ " to 1" diameter and from  $\frac{3}{16}$ " to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

**SCHULTZ & ANDERSON CO.**

109 Edison Place, Newark 5, N.J.

## LOW COST LOCATING BY CENTER SCOPE

**Dependable  
Accuracy.**

Ample Adjustment  
For Spindle  
Run-Out.  
For  
Drill Presses,  
Lathes, Mills.

SERIES "M"

**\$24.50**

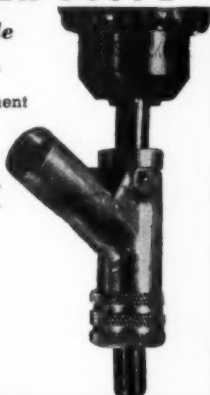
CASE EXTRA

**\$3.50**

Bulletin M-8

**CENTER SCOPE PRODUCTS**

3829 San Fernando Rd., Glendale 4, Calif.



## The New SAND BRUTE



NEW MODEL "E"  
LIGHT WEIGHT  
ONLY 13 LBS.

Save time on those sanding jobs. Use the new Model "E" SAND BRUTE. All magnesium housing . . . rugged . . . high speed . . . dependable. Send for circular on this, and our other models.

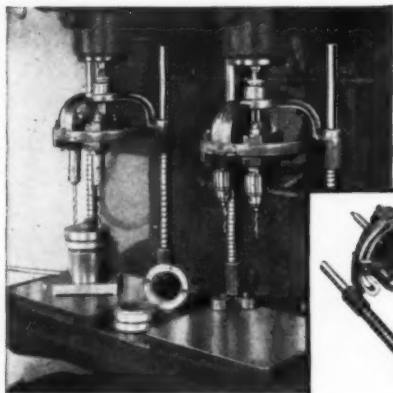
**Nedco COMPANY** Waltham 24, Mass.

## BAUMBACH THE DIE SET AUTHORITY

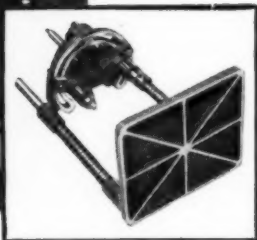


All Baumbach Die-Sets have demountable Leader Pins and moving Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

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1810 S. KILBOURN AVE. CHICAGO 23, ILL.



Overarm Type has heavy guide pins, ground base 12 by 14 inches.



## LINDERME 2-Spindle Head

*"increased production from 160 to 600 an hour"*

This story is typical of the many applications of Linderme 2-spindle drill heads on long and short runs. You'll like these features: drills, taps—in metal, wood, plastics; quick, accurate adjustment,  $\frac{1}{2}$ " to 6" centers; two minute set-up on most drill presses in

your shop; anti-friction bearings, rugged gearing, quality machining—and Linderme's low initial cost for Overarm or Sleeve Types—Twelve models, capacities up to  $\frac{3}{4}$ ", available with G.M. Sleeves or Morse Tapers. Write for complete catalog.

**LINDERME MACHINE AND TOOL CO., INC.**

**12253 COYLE AVE. • DETROIT 27, MICH.**

### ASTE NAMES SCOTT EMISSARY TO BRITISH ENGINEERS

James Y. Scott, president of Van Norman Co., Springfield, Mass., and president of the Morse Twist Drill Company, New Bedford, Mass., has been named special emissary by the American Society of Tool Engineers to the Institution of Production Engineers in England.

Scott will attend a meeting of the British organization at Wolverhampton, England, May 28, at which he will present to the president of the Institution an honorary life membership in the American Society of Tool Engineers. This

membership is handed down to each succeeding president. The AS-TE president holds a similar membership in the British IPE. Each organization is considered the counterpart of the other in its respective country.

The newly-appointed AS-TE emissary will leave New York by plane May 10 and will spend some time in England, Scotland, and Ireland visiting British plants and making a survey of production methods abroad.

In making the announcement of Scott's appointment, Harry E. Conrad, Executive Secretary of the AS-TE, pointed out that cooperation between the British Institution of Production Engineers and the American Society of Tool Engineers has been much closer since the war than previously.

"Both countries have a common problem," Conrad said, "and we are using our best collective resources

and brains to solve it.

"The salvation of our whole economy and the preservation of the enterprise system hinges on one factor: production. We must exchange and disseminate technical and scientific data and information if we are to achieve the production goals necessary to bring economic order out of chaos. This is the real meaning behind the feeling of brotherhood that exists between the American Society of Tool Engineers and the Institution of Production Engineers." The aim is to help Britain regain self-sufficiency.

## BURR KEYSEATERS



Mill keyways in the run or on the ends of shafting already erected—save money on alteration, erection, and repair work.

Made in 4 sizes, for hand or motor operation.

Write for Bulletins and prices.

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TRADE MARK REG. U. S. PAT. OFF.

### ANTI-FRICTION COMPOUND

SERVING INDUSTRY FOR 34 YEARS

Cools hot bearings • Solves toughest lubricating problems • Saves wear on moving parts • Works wonders with cutting oils • Packed in 5-10-25-50-100 lb. containers. Write for Free Sample.

**SCIENTIFIC LUBRICANTS CO.**  
3469 N. Clark St. Chicago 13, Ill.



### Save Space and Lifting

Yohe Racks take less floor space, hold more stock and require less lifting. Four arm rack, 51" high stacks, 10,000 lbs. Five arm rack 57" high holds 12,000 lbs. flat or round stock—at safe lifting heights. Use against wall or back-to-back in center of room.

Let us send details and prices

**WM. S. YOHE SUPPLY CO.**  
503 Mahoning Rd., N.E. Canton, Ohio

## STANDARD PARTS



FOR  
JIGS, FIXTURES  
DIES, GAGES, TOOLS  
AND MACHINERY  
Featuring

Hand Knobs, Quarter Turn Screws, Spherical Washers, "C" Washers, Jig Feet - Locating Keys  
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Inquiries for Tool Die and Mold Estimates Invited.

**GEORGE F. BUB AND SON**  
11415 MADISON AVE., CLEVELAND 2, OHIO

## Semi-machined DRILL CHUCK ARBORS



For fitting drill chucks and other tools to lathe spindle or turret head. Made of steel with ground shank. You machine to fit chuck or other tools.

**SOUTH BEND LATHE WORKS**  
420A East Madison Street, South 22, Indiana

**ARBORS with**  
No. 2 taper shank . . . \$0.85  
No. 3 taper shank . . . 1.50  
5/8" straight shank . . . 1.15  
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See your dealer—or send direct postpaid.

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## ••••• CARROLL ••••• DIVIDING HEADS



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3 SIZES - 4 MODELS - 6" to 12"

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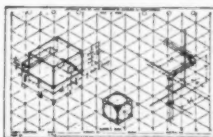
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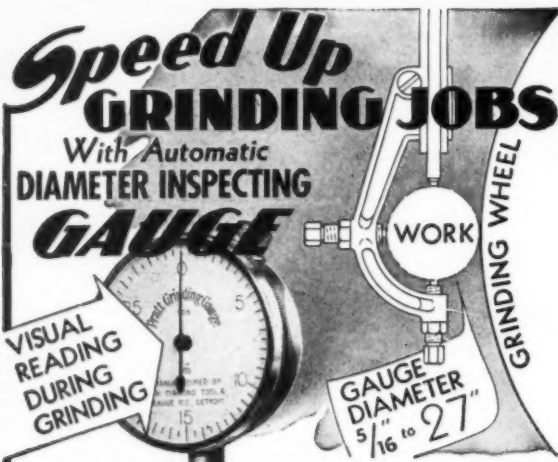
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#### STEVENSON URGES RAPID AMORTIZATION OF EQUIPMENT

If the Government wants to increase the productive capacity of the country for defense and for the European recovery program, it should allow manufacturers to amortize rapidly all investments in capital equipment, according to Cary H. Stevenson, vice-president of Lindberg Engineering Company, Chicago, who was elected president of the Industrial Furnace Manufacturers Association, Inc. at its 18th Annual Meeting at The Homestead, Hot Springs, Virginia.

The results of a three year depreciation

Send for Bulletin

rule on plant equipment could be analyzed as follows, according to Mr. Stevenson:

(1) It will encourage the modernizing and expanding of the country's productive capacity which is generally agreed to be almost a direct measure of ability to wage modern war.

(2) The use of modern automatic high speed equipment will aid in abating manpower shortage, one of the most serious problems of war.

(3) New and efficient manufacturing equipment will result in more production per man hour, which is generally acknowledged as a solution to inflation.

(4) It will increase the capacity of our equipment manufacturers on whom we rely for war expansion, because equipment manufacturers also need production tools. Industrial furnace, oven and machine tool manufacturers are in most cases small companies who do

not have large capital or access to the large capital markets.

(5) Modern industrial furnaces and ovens would save billions of heat units, thus alleviating the shortage of heating gas, oil and electric power.

(6) Rapid depreciation is an important step in helping small business.

(7) Modern equipment is a boon to the worker for it means less "strong back" work, cleaner cooler working conditions.

(8) Depreciation moves to more conservative corporation finances.

(9) It tends to smooth out government income.





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### IFMA APPOINTS INDUSTRY WAR MOBILIZATION COMMITTEE

In the interest of national security, an industry war mobilization committee was appointed by the Industrial Furnace Manufacturers Association, Inc., 420 Lexington Ave., N. Y. 17, at its eighteenth annual meeting at The Homestead, Hot Springs, Virginia. The Association members were afraid that unless they took the initiative in outlining a plan for the mobilization of the industry in case of war, the same confusion that existed at the beginning of the last war would

be experienced again. The retiring president of the Association, William Adam, Jr. of the Ajax Electric Co., Inc., Philadelphia, was appointed chairman of this committee which will lay the results of its work before the Facilities Division of the Munitions Board in Washington.

C. H. Stevenson of the Lindberg Engineering Company, Chicago, was elected President and Chairman of the Board for the ensuing year. In his remarks of acceptance he said that if the Government wants to increase the productive capacity of the country for defense and for the European recovery program, it should allow manufacturers to amortize rapidly, in three but not more than five years, all investments in capital equipment. He also said that this could be done with little or no decrease in tax revenues and that the increased production resulting from the in-

stallation of the more modern equipment would soon result in increased earnings, increased tax revenue to the government and better working conditions for the operators of the machines.

The Association is making a quarterly survey for the benefit of members to show the trends of inventories, deliveries, and prices of materials and purchased component parts of furnaces and also of the trend of the business. The survey presented at this meeting showed that the same or better business would prevail for the balance of this year.

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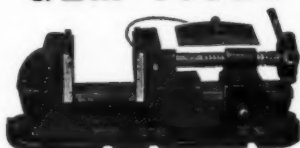
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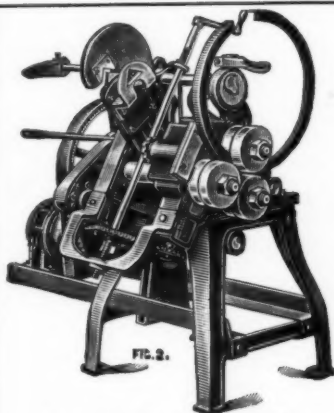


FIG. 2.

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ROLLS ANGLES, TEE IRON, PIPE,  
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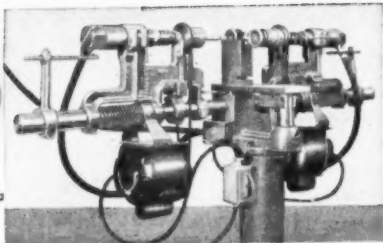
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### **ASM ANNOUNCES PLANS FOR 1948 METAL CONGRESS**

The 30th Annual Metal Congress and Exposition will be held in Philadelphia's Commercial Museum and Convention Halls for five days beginning Monday, October 25th.

W. H. Eisenman, national secretary of the American Society for Metals and managing director of the Exposition, announced locale and dates and stated that the Exposition will again be sponsored by the American Society for Metals.

Floor plans for the 1948 Exposition

were mailed early this week to former exhibitors, while mailings to others will be made later.

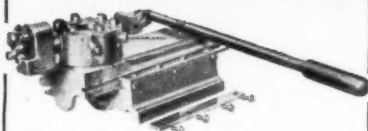
Commenting on the selection of Philadelphia as the 1948 NMCE city, Mr. Eisenman stated that "because of the international importance of the National Metal Congress and Exposition to the world of metals, the event is held in principal metals working industrial areas. Philadelphia, near the center of the nation's eastern industrial area, logically is the selection for this year since it is readily accessible to metallurgical engineers and scientists from the northeast Atlantic seaboard and adjacent industrial centers. Too, the city's excellent facilities for handling the great displays and large number of visitors has been an important consideration."

Meeting simultaneously with the American Society for Metals will be

the American Welding Society, the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers and the Society for Non-Destructive Testing (formerly the American Industrial Radium and X-Ray Society). These societies will conduct technical programs relating to the science of metals during the week of October 25th.

The 1948 Metal Congress and Exposition marks the fourth time that the event has been held in Philadelphia. Previous Expositions were held in 1920, 1928 and 1941.

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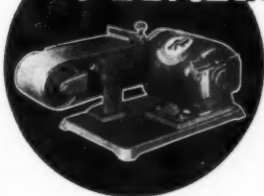
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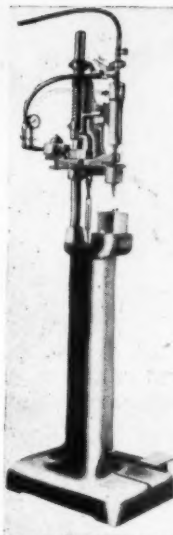
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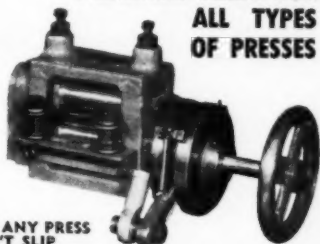
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#### WAR MANPOWER DIRECTOR TO HEAD AMERICAN MANAGEMENT ASSOCIATION SUCCEEDS ALVIN E. DODD

Appointment of Lawrence A. Appley, vice president of Montgomery Ward and Company, as president of the American Management Association (330 W. 42nd St., N. Y.) and elevation of Alvin E. Dodd, AMA president for the past 12 years, to the newly created post of honorary president was announced by John M. Hancock, chairman of the board of AMA and a partner in the New York banking firm of Lehman Brothers.

Mr. Appley, a former deputy chairman and executive director of the War Manpower Commission, will leave Montgomery Ward and Company on July 1 to assume direction of the activities of AMA's membership of more than 12,500 executives in virtually every type of American industry. In his new capacity he will guide the Association's nationwide conferences, publications and research aimed at the solution of management problems by a broad exchange of information and experience in American industry. He will, however, continue to serve the Montgomery Ward and Company as a director.

In making the announcement, Mr. Hancock said that "at this time of ideological clash throughout the world, AMA realizes it is more than ever urgent to continue to provide a means for executives in American industry to pool their experience and knowledge of the methods by which men can be brought to cooperate for common purposes."

Mr. Appley, 46 and a nationally known expert in industrial relations, accepted the full-time responsibilities of AMA chief executive as a "unique opportunity to contribute to the science of management." He said that "much of the future of the nation depends on management's professional ability to achieve lasting co-operation with labor, to find means to stabilize the national economy, and to integrate the organization of the nation's industry with its social structure."

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### INDUSTRY IMPROVES SAFETY RECORD

Industry closed its books on 1947 with a better safety record than the year before, according to the National Safety Council, 20 N. Wacker Drive, Chgo. 6.

Coal mining stayed at the bottom of the list again, with the highest accident severity rate of 7.96.

The 1947 industrial injury rates, released in advance of the 1948 edition of

"Accident Facts," the Council's annual statistical year-book, show that the over-all accident picture is improving.

The accident frequency rate for all industries submitting company reports to the council, based on the number of disabling injuries per 1,000,000 man-hours, was 13.26 in 1947, a reduction of 10 per cent from the year before.

The communications industry again had the lowest frequency rate, leading all other industries last year with a rate of 2.98, a 10 per cent reduction from 1946. The second place industry was electrical equipment, with a frequency rate of 6.02, down 21 per cent from 1946 when it placed sixth.

At the other end of the list, coal mining climbed up one step from the bottom position as the result of 7 per cent reduction. Its 1947 rate of 54.46 was better than the lumbering industry which had the highest 1947 frequency rate of 59.

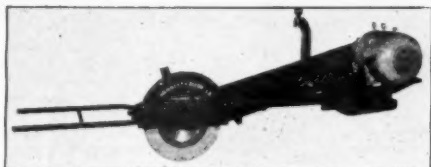
74. Lumbering was second highest in 1946.

The accident severity rate for all industries reporting to the Council, based on the number of days lost per 1,000 man-hours, was 1.23 in 1947, a reduction of 7 per cent from the year before.

Communications again led all other industries with the lowest severity rate. Its 1947 rate was .16, a reduction of 24 per cent from the previous year. Wholesale and retail trade ranked second.



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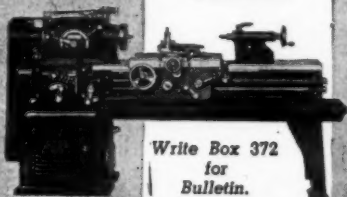
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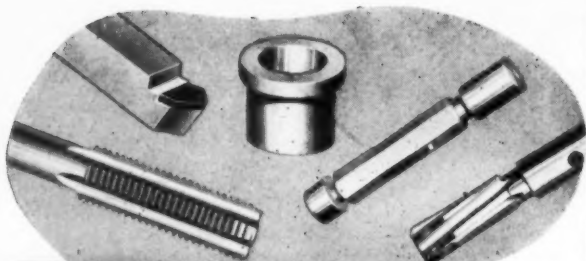
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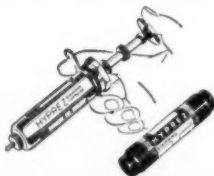
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### **WIREBOUND INSTITUTE SPONSORS INDUSTRY TRAINING PROGRAM**

Inauguration of the second class of the Wirebound Institute, unique industry-wide technical training program sponsored by the Wirebound Box Manufacturers Association, 39 S. La Salle St., Chgo. 3, for the personnel of its member companies, has been announced simultaneously with completion of the second nationwide series of "clinics" held for

registrants of the first class.

L. S. Beale, secretary of the association, said that 95 employees of W. B. M. A. member companies have been registered for the new class in the course. Some of them have entered the wirebound shipping container industry since the Wirebound Institute was inaugurated a year ago, while others were unable to register, for various reasons, in the first class. They include sales and production personnel.

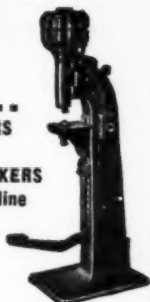
The Wirebound Institute was established by the W. B. M. A. to assure the wirebound shipping container industry a body of men technically trained and thoroughly grounded in the intricate science of shipping container engineering. Originally, 276 students registered for the course. A total of 224 attended the most recent series of one-day "clinics" held in Chicago, Cleveland, New York, Louisville, San Francisco, New Orleans, and Jacksonville, Fla.

Beale said that those originally registered, who did not attend the "clinics," included many men who have left the wirebound industry or who fell behind because of illness. Several of the latter group have re-registered for the new class. Attendance at "clinics" is required to maintain eligibility in the course and is restricted to those who are eligible through completion of the required number of lessons.

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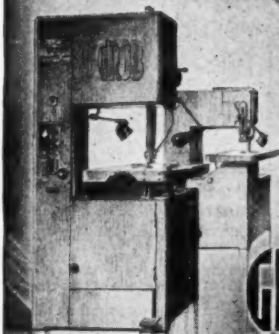


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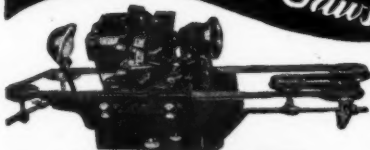
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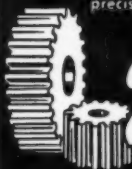
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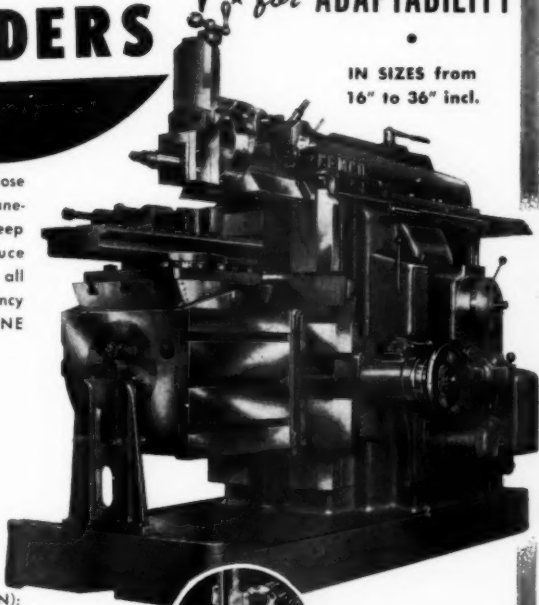
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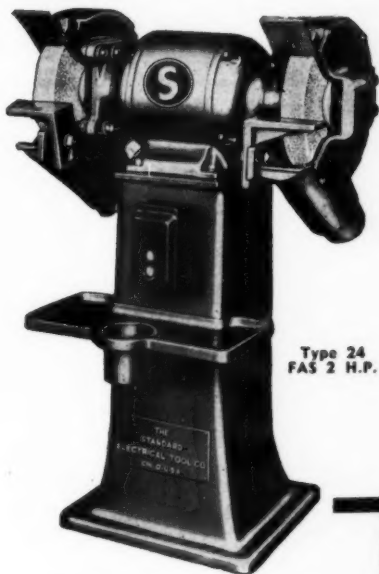
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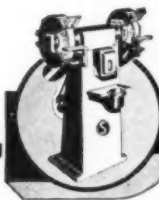
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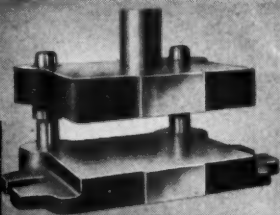
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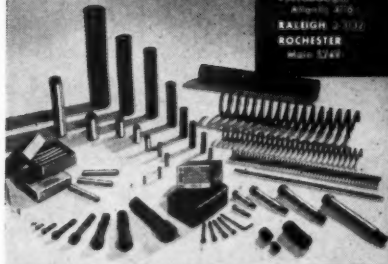
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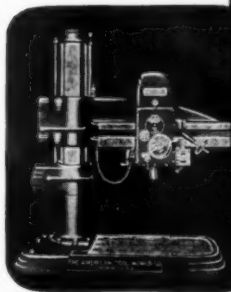
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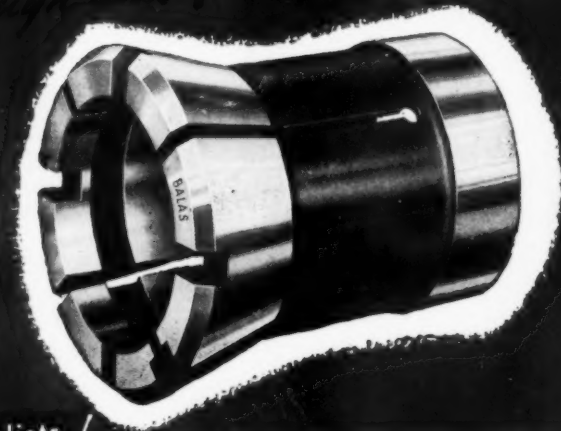
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